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Evaluating the Critical Thinking Skills and Academic Characteristics of Undergraduate Students at Two Post-Secondary Institutions Utilizing Two Different Curriculum Models

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by

Michael Robert Hepner

A Dissertation submitted to the Education Faculty of Lindenwood University

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degree of

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This dissertation has been approved in partial fulfillment of the requirements for the degree of

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at Lindenwood University by the School of Education

Dr. Graham Weir, Dissertation Chair — 11/30/12 Date

Dr. Bryan Charles Reaka, Committee Member — 11-30-2012 Date

Barbara Wiseheart, JD, M.Ed, Committee Member — 11/30/2012 Date

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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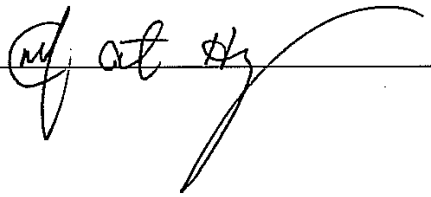
Signature:  Date: 11/30/2012

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Abstract

This mixed methods study compared the critical thinking skills of students at two post-secondary education institutions that utilize two different curriculum models. A contemporary institution that offers a core curriculum and degree specialization (majors) was contrasted with a Great Books school that utilizes a canon of primary sources and relies on Socratic dialogue in the classroom. All students who complete the four-year Great Books program are awarded a bachelor's degree in liberal arts as opposed to a specialized degree.

The two sample populations (N=25) had similar demographic profiles, high school experiences, and college entrance exam scores, as well as similar college grade point averages and college social experiences as determined by a questionnaire, project data sheet, and a series of interviews used to elicit qualitative data for this project. The critical thinking skills of the participants were assessed using the Ennis-Weir Critical Thinking Essay Test. Observable differences were found between the two sample populations' overall scores on the Ennis-Weir test, as well as their scores on three of the test's five subscales measuring evaluation of argument, deduction, and inference.

The findings of this project suggest that the curriculum and teaching methods at the school employing the Great Books model (n=14) may have a positive impact on the development of that sample population's critical thinking skills; however, many factors hinder the researcher from declaring absolute causation, such as the small sample population size, so attributing the reported differences solely to the Burgundy College curriculum and teaching methods is not possible.

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Chapter 1: Introduction

Overview

This introductory chapter highlights the importance of developing the critical thinking skills of American college and university students. The researcher presents a hypothesis, a null hypothesis, and two research questions indicating the researcher's intention to test the impact of two different curriculum models on the critical thinking skills of post-secondary students, as well as the researcher's intention to gather qualitative data to find any factors that may impact the sample populations' critical thinking skills. This chapter also provides definitions of important terms used in the study. Finally, the researcher noted any limitations of this study and any measures taken to address those limitations.

Background

The development of a person's critical thinking ability is regarded as an important, if not necessary, outcome of post-secondary education. According to Dewey (1933), learning how to think critically is the central purpose of education. This notion was further adopted by Scriven, a scholar in the fields of psychology and philosophy, as he wrote that "training in critical thinking should be the primary task of education" (1985, p. 11). The development of critical thinking skills is important as such skills can translate to prosperity in the job market as employers "increasingly demand workers who not only have technical expertise but also general skills in areas such as critical thinking, written communication, and complex reasoning" (Roksa, 2010, p. 390).

A brief examination of college mission statements almost always reveals the goal of improving undergraduate students' critical thinking skills. In fact, according to former

Harvard University President Derek Bok (2006), various "nationwide polls have found that more than 90 percent of faculty members in the United States consider it (critical thinking) the most important purpose of undergraduate education" (pp. 67 – 68). Such a goal is admirable as most employers and highly regarded graduate schools seek evidence of solid critical thinking skills in potential employees and students (Kavanagh & Drennan, 2008; Saavedra & Saavedra, 2011; Yeh, 2001).

However, as the tools used by most workers in business and industry today become more technical (Price & Reece, 1991), and as post-secondary institutions continue to tighten their budgets, undergraduate institutions are cutting courses deemed unnecessary, which many times includes courses within the core curriculum. Core curriculum courses are those that are intended to bolster a student's critical thinking ability (Justice, Rice, Roy, Hudspith & Jenkins, 2009; Facione, Sanchez, Facione & Gainen, 1995). Idaho State University approved changes to its core curriculum in 2012 to address state budget issues that resulted in a reduction of their core curriculum from 61 credit hours to 40 credit hours while maintaining the stipulation that all students who graduate with a four-year degree must earn at least 120 total credit hours (Idaho State University, 2012). The reduction in the core curriculum made way for the students to focus more on their areas of specialization rather than the development of their critical thinking skills through core curriculum.

In addition to the changes in the core curriculum at Idaho State University, the University of Arkansas at Fayetteville's Fulbright College of Arts and Sciences planned to reduce its core curriculum from 66 hours to 35 hours in order to make way for more specialized courses and to reduce costs by having faculty concentrate on their own areas

of specialization while in the classroom (University of Arkansas, 2010). In addition, University of Chicago President Hugo F. Sonnenschein cited financial issues when he proposed a measure, which was later approved, that gradually reduced the university's core curriculum from 63 credit hours to 54 credit hours (Chicago Maroon, 2004).

According to Bok, as cited in Arum and Roksa (2011), college graduates may not be receiving all of the benefits that traditionally have been associated with the awarding of a college degree because "colleges and universities, for all of the benefits they bring, accomplish far less for their students than they should" (p. 3). Bok also has declared that most students graduate college today "without being able to write well enough to satisfy their employers, reason clearly or perform competently in analyzing complex, non-technical problems" (as cited in Arum & Roksa, 2011, p. 3), all of which are signs that college students are graduating without strong critical thinking skills.

These issues are not simply the product of a poor post-secondary education. High school students are entering college without strong writing skills, as evidenced by a 2003 National Center for Education Statistics study in which only 22% of high school seniors had persuasive writing skills that were considered competent, while only 9% had excellent writing skills. Bean (2011) argued that writing skills and critical thinking skills are not two isolated skill sets; instead, they are inseparable skills because "formal academic writing requires analytical and argumentative thinking" (p. 22). Analytical and argumentative thinking are both skills that many within the academy recognize as integral to developing solid critical thinking skills (Ennis & Weir, 1985; Facione, 2000; Facione, Facione, & Giancarlo, 1996; Halpern, 1998; Paul, 1992; Paul & Edler, 2002; Willingham, 2007).

Furthermore, according to a 2006 report from the United States Department of Education titled *A Test of Leadership: Charting the Future of U.S. Higher Education,* researchers found that American college students scored relatively low on the National Assessment of Adult Literacy. The conclusion can be drawn, then, that those same students lack critical thinking skills because, according to Olson (1994), literacy is an instrument in the development of cognition and critical thinking ability. Many scholars in the field of early childhood development recognize that literacy development begins at a very young age, even before a child formally learns to read (McMunn-Dooley & Matthews, 2009; Alexander, 2006; Clay, 1966), which means that any early deficiencies in literacy will signal further deficiencies in cognitive ability and critical thinking later in life.

American students, by and far, are not only enrolling in post-secondary institutions without critical thinking skills, but are being granted college degrees without developing the critical thinking skills necessary to do well in most mid-level corporate positions or to succeed in highly competitive graduate programs. Of the 8,675 graduating sophomores at 51 American community colleges who took the Educational Testing Service's (ETS) Academic Profile Test in 2004, only 11% scored in the marginal range, and a mere 3% of the scores were considered proficient. This trend continued as documented by the 2005 Association of American Colleges and Universities (AACU) study, which found that only 6% of college and university seniors graduate with critical thinking skills considered proficient. However, a tremendous disconnect exists between these survey results and the perceptions of those graduating seniors, as the same AACU survey found that 87% of those seniors believed that college contributed a great deal to improving their critical

thinking ability. This sort of trend is nothing new as Adler (1982) concluded that students are not learning in college and that "the educational process in America is either a rather pleasant way of passing time until we are ready to go to work, or a way of getting ready for some occupation, or some combination of the two" (p. v).

Statement of the Problem

Many colleges and universities have seemingly lost sight of the importance of their core curriculum, also widely known as general education, which is designed to accomplish the same critical thinking development as liberal education while giving students a chance to focus on degree specialization without adding additional time to the standard four-year baccalaureate degree. Liberal education may seem to be unimportant because students are not learning a skill that can be immediately performed and quantified. However, liberal education is certainly vital as it was developed to give students a "broad knowledge of the wider world (e.g. science, culture and society)" and "a sense of social responsibility, as well as strong and transferable intellectual and practical skills such as communication, analytical, and problem-solving skills" (Association of American Colleges and Universities [AACU], 2005).

According to Brint (2009), faculty and administration need to better communicate the importance of general education because "core curriculum, on average, comprises approximately 30% of the undergraduate curriculum and therefore represents an important feature of the academic experience" (p. 605). According to an American Council of Trustees and Alumni (ACOTA) 2009 report, even the once important core curriculum has seen better days as "rather than offering a true liberal education designed to liberate the mind, (the schools included in the study) are in effect leaving it up to

students to figure out what they will need—and families are paying dearly for the privilege of a do-it-yourself curriculum" (p. 13). The ACOTA report surveyed 100 post-secondary institutions and included the top 20 National Universities and top 20 Liberal Arts Colleges as reported in the 2009 *U.S. News & World Report* America's Best Colleges rankings, as well as 60 major public universities from all 50 states. The results of their research found that "25 received an F for their core curricula, 17 got Ds, and 20 got Cs. Only 33 out of the 100 earned Bs, and only 5 out of the entire group earned an A" (ACOTA, 2009, p. 12)

Despite Arum and Roksa's (2011) argument that some educators from the nation's most prestigious colleges and universities have recognized deficiencies in the higher education offered today, namely in that students are graduating without critical thinking skills, those same educators recognize that core curriculum is shrinking to make room for increased requirements within areas of specialization. Arum and Roksa argued that there is a need to protect the core curriculum as colleges and universities move further away from higher education's foundation in liberal education by lowering the number of credits within the core curriculum.

Purpose of the Dissertation

The purpose of this mixed methods study is to compare the critical thinking skills of students using the Ennis-Weir Critical Thinking Essay Test at two schools that use two different curriculum models. The first is a Great Books school that promotes liberal education by employing a canon of Great Books, primary sources, and Socratic dialogue in the classroom and that exclusively offers a bachelor's degree in liberal arts, while the second is a more contemporary school that focuses on degree specialization while

primarily relying on secondary sources in the classroom and that offers bachelor's degrees in a variety of disciplines. After assessing the students' critical thinking skills, and controlling for the students' initial academic ability by comparing their academic histories, the researcher combed the qualitative data gathered from the students to find any factors that could have contributed to any differences in the critical thinking ability of the two sample populations. With the results of this exploratory study as a foundation, the researcher will be able to discuss implications for practitioners and recommendations for further research.

Rationale

A growing fear amongst scholars is that without the critical thinking skills developed in many traditional educational approaches, such as those found in liberal education, students will graduate from college without the skill to creatively apply learned facts and concepts to new and varying situations (Arum & Roksa, 2011; Nussbaum, 2010; Saavedra & Saavedra, 2011). Finding significant differences between the critical thinking skills of students at the school promoting liberal education versus those of students attending the institution focusing on degree specialization is noteworthy in and of itself. However, if these differences can be examined alongside other academic characteristics of the students to control for self-selection bias, conclusions can be drawn about the strengths, weaknesses, and effectiveness of both curriculum models, and improvements can be made based on those conclusions. Of course, because of the small sample sizes included in this project, further research needs to be conducted before any definitive conclusions can be drawn.

Hypotheses and Research Questions

Hypothesis: Undergraduate students enrolled in a school focusing on liberal education will achieve higher test scores on a standardized critical thinking exam when compared to the test scores of students enrolled in a school that focuses on degree specialization.

Null Hypothesis: No differences will exist between the scores on a standardized critical thinking exam between undergraduate students enrolled in a school focusing on liberal education when compared to the scores of students who are enrolled in a school that focuses on degree specialization.

Research Question #1: Are there differences in how students think about critical thinking between students who attend a school that focuses on liberal education versus students who attend a school that focuses on degree specialization?

Research Question #2: Are there important differences in any academic and/or personal characteristics of students who attend a school that focuses on liberal education versus students who attend a school that focuses on degree specialization that can explain any disparity in the critical thinking ability of the two populations?

Limitations

This study included a sample population of students from a small Midwestern college, referred to henceforth as Panther College, which focuses on degree specialization and offers a total of 55 specialized degrees (majors). This study also included a sample population of students from a small New England college, referred to henceforth as Burgundy College, which relies solely on the Great Books curriculum fashioned after the

medieval trivium and quadrivium (defined in the Definition of Terms). Although the findings in this exploratory study may certainly prove useful to practitioners at other post-secondary institutions, applying these findings to other populations may be risky unless future samples share analogous characteristics (Gall, Borg, & Gall, 1996). The characteristics of the sample populations in this particular study are presented and discussed in Chapter 4.

Generalizability is the primary limitation of this project given its sample size of only 25 usable research packets produced by the participants at both post-secondary institutions. The research packets included the Ennis-Weir Critical Thinking Essay Test, questionnaire, and project data sheet. Ninety-one percent of the participants at Panther College completed the entire research packet. In addition to the research packets, seven students at Burgundy College participated in face-to-face interviews with the researcher, while five participated in the same interviews at Panther College. Eighteen students participated in the study at Burgundy College; however, only 16 students fully completed the research packets. Of those 16 students who fully completed the research packets, two students requested in writing that their results not be included in the study for unspecified reasons.

As with many projects similar to the one presented here, researchers strive to account for and minimize the Hawthorne Effect (Franke & Kaul, 1978). This project was designed so that all participants knew they were participating in a study of their critical thinking skills; therefore, the Hawthorne Effect should be significant but equal as students at both schools should be affected homogeneously.

Another potential concern associated with this project is the issue of self-selection bias. Although self-selection bias usually hinders the determination of causation, the researcher in this study has taken great lengths to design a questionnaire and interview protocol that can uncover any causative factors that may account for any difference between the two groups' critical thinking skills. These instruments should eliminate any problems with the evaluation of the education offered at both schools, as the purpose of the study is to find any factor that may affect the results of the Ennis-Weir Critical Thinking Essay Test.

Many scholars are weary of the Ennis-Weir Critical Thinking Essay Test because of perceived issues of interrater reliability. However, according to Hatcher (2011), achieving an interrater reliability of .85 or better is possible when using bright and trained graders. With this in mind, the researcher chose to employ a doctoral candidate at another university to grade the pilot Ennis-Weir tests conducted with students at Saint Louis Community College. The scorer and the researcher initially achieved an interrater reliability of .92 after grading 25 exams. Interrater reliability jumped to .96 after discussing and regrading the two Ennis-Weir tests with scores that were beyond the acceptable three-point threshold. The researcher again employed the same scorer to grade the tests of the Panther College and Burgundy College sample populations to help avoid any issues with interrater reliability.

Definitions of Terms

Argument: According to Paul (1993), an argument "is a reason or reasons offered for or against a proposal or proposition" (p. 12).

Critical Thinking: The "Delphi Report," a research project developed by 46 scholars across various disciplines, defined critical thinking as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (Facione, 1990, p. 2).

Critical Thinking Disposition: "The consistent internal motivation to engage problems and make decisions by using thinking" (Facione, 2000, p. 64).

Degree Specialization: Commonly known as an academic "major" in the United States, degree specialization refers to a student's concentration within one academic discipline.

Great Books Curriculum: A curriculum employing a canon of books and primary documents that best express the foundations of Western civilization.

Liberal Education: "Liberal Education is an approach to learning that empowers individuals and prepares them to deal with complexity, diversity, and change. It provides students with broad knowledge of the wider world (e.g. science, culture, and society) as well as in-depth study in a specific area of interest. A liberal education helps students develop a sense of social responsibility, as well as strong and transferable intellectual and practical skills such as communication, analytical and problem-solving skills, and a demonstrated ability to apply knowledge and skills in real-world settings" (AACU, 2005).

Low-inference Observation: A classroom/instructor observation technique that focuses on specific, observable, objective behaviors (Rosenshine, 1970, p. 281).

Primary Sources: "The materials that were created by those who participated in or witnessed the events of the past" (Potter, 2003, p. 372).

Secondary Sources: A secondary source is an outside interpretation or analysis of an event from the past (Wyman, 2005).

Socratic Dialogue: "A philosophical group dialogue in which the participants, guided by a facilitator and a number of ground rules, strive to reach a consensus in answering a fundamental question on the basis of a real-life example or incident with the purpose of achieving new insights" (Knezic, Wubbles, Elbers, & Hajer, 2010, p. 1106).

Trivium: The trivium was a major part of the medieval university consisting of grammar, logic, and rhetoric, all of which were taught first to new students before they moved on to the Quadrivium.

Quadrivium: The Quadrivium consisted of four subjects at the medieval university, arithmetic, geometry, music, and astronomy, which, along with the trivium, formed the seven liberal arts, which were set apart from the practical arts, such as medicine, theology, and law.

Conclusion

This initial chapter established that there is substantial interest in developing the critical thinking skills of American college and university students. A hypothesis, null hypothesis, and two research questions have been proposed indicating this researcher's intention to assess students' critical thinking dispositions and to find any differences in the students' personal and/or academic characteristics that may be revealed using the project's data sheet, qualitative questionnaire, and transcripts of the students' face-to-face

interviews with the researcher. Finally, definitions of important terms were provided in this chapter, as well as limitations of this project and how they were addressed.

The literature review in Chapter 2 provides a set of academic definitions of critical thinking, as well as an in-depth look into the nature of both philosophy-based and psychology-based definitions of critical thinking, followed by an introduction to a critical attempt at consensus by various academic disciplines. In addition, Chapter 2 includes a short survey of liberal education and critical thinking skills in American undergraduate education, a status report of general education today, as well as strategies and methods of developing undergraduate critical thinking skills and assessment of critical thinking skills. Chapter 2 in no way provides an exhaustive list of issues regarding critical thinking skills; however, these are the most pertinent issues to this study, and they form the basis of what is described in the following chapters.

Chapter 2: The Literature Review

Overview

This study integrated many important areas of the history of higher education and post-secondary theory, and, while each area can certainly stand on its own, this chapter produced an amalgamated perspective. This chapter is divided into the following sections: 1) academic definitions of critical thinking; 2) philosophy-based definitions of critical thinking; 3) psychology-based definitions of critical thinking; 4) an attempt at consensus amongst the various disciplines; 5) a short survey of liberal education and critical thinking skills in American undergraduate education; 6) the status of general education today; 7) strategies and methods of developing undergraduate critical thinking skills; and, 8) assessment of critical thinking skills. This is in no way an exhaustive list of issues regarding critical thinking skills; however, these are the most pertinent issues to this study, and they form the basis of what is described in the following chapters.

Academic Definitions of Critical Thinking

Scholars in various disciplines have been discussing critical thinking for centuries; however, even today, *critical thinking* does not have a universal definition (Kennedy, Fisher, & Ennis, 1991), with much of the debate raging amongst philosophers and psychologists (Lewis & Smith, 1993). These two academic disciplines have developed several definitions of critical thinking and each discipline use terms such as "critical thinking" and "higher order thinking" interchangeably (Halpern, 1993). Further investigation muddies the quest for a singular definition, as terms such as "reasoning," "argumentation," "critical reflection and judgment," "problem solving," and "metacognition" all are used seemingly interchangeably amongst the different disciplines.

Although, on the face of it, there are an infinite number of scholarly works on critical thinking ability, or articles that cover critical thinking ability under a different name, there is no definitive answer to the question: What exactly are critical thinking skills?

Two distinct disciplines, philosophy and psychology, deal with the development of critical thinking skills more than most others. While philosophers tend to focus on the behaviors and actions of the thinker, as well as the product of the thinker (Thayer-Bacon, 2000), psychologists tend to focus on the cognitive process of the thinker more than the product (Sternberg, 1986). While these two academies have debated in academic publications to find a superior definition of critical thinking, researchers in education have noted the importance of gleaning from both groups in order to develop their critical thinking theory and determine how to convey critical thinking skills to students (Kuhn, 1992; Weinstein, 1995; Condon & Kelly-Riley, 2004).

Philosophy-Based Definitions

Philosophers have been attempting to define and promote critical thinking since the world was warned about the dangers of subpar education and the resulting lack of critical thinking skills in 380 BCE (Jowett, 2009). Plato claimed that education of the mind is perhaps the best practice for a good life. Socrates offered the following warning in the *Protagoras* to those who may be lured into pursuing a substandard education:

> O my friend, pause, and do not hazard your dearest interests at a game of chance. For there is far greater peril in buying knowledge than in buying meat and drink: the one you purchase of the wholesale or retail dealer, and carry them away in other vessels, and before you receive them into the body as food, you may deposit them at home and call in any experienced friend who knows what is good to be

> eaten or drunken, and what is not, and how much and when; and then the danger of purchasing them is not so great. But you cannot buy the wares of knowledge and carry them away in another vessel; when you have paid for them you must receive them into the soul and go your way, either greatly harmed or greatly benefited. (Jowett, 2009, p. 30)

Perhaps one of the greatest analogies for developing critical thinking skills is the Cave Analogy provided by Socrates in Plato's *Republic*, in which Socrates explained the process of coming to know what is good through the development of critical thinking skills, though this term is not mentioned explicitly. Socrates described a cave in which humans are chained facing a wall from birth; behind them, passing puppeteers cast shadows on the wall in front of the prisoners with figurines and other items they are carrying. Because the prisoners know nothing else, they assume that the shadows constitute the entire realm of reality; however, what they see is only a small part of the world. Glaucon, Socrates' interlocutor, easily grasped the idea behind the analogy and realized that education, or more specifically, liberal education of the mind, is meant to free the prisoners from their false opinions and convictions, as opposed to chaining them within the cave as did their earlier education (Jowett, 2009).

Socrates documented the various reactions of the prisoners if unchained and allowed to learn of the rest of the world. He described the prisoners as pained and disoriented by their new world, overwhelmed by rebellion without reason, and blindness that would force them to return to the comfort of the cave. Socrates also spoke of rough transitions into the new world that would result in resentful prisoners wanting to fight. The best way to enter into this new world of knowledge is slowly so that the prisoner's

eyes can adjust to see the shadows, then reflections in the water, then things themselves and the night's sky, and finally, the sun, an image of the good and what is. Once the prisoner is able to focus on what is, he will be happier than ever and never want to return to the cave. The cave no longer will be a place of solace, but instead a place where the remaining prisoners will hate and revolt against the former prisoners and refer to them as delusional because the reality of the remaining prisoners is still limited to the shadows in the cave (Jowett, 2009).

Just as Plato was adamant that the cave was not the ideal setting for critical thought, contemporary scholars, such as Sternberg (1986), focus on the product that is developed by ideal critical thinkers under the perfect circumstances. In fact, Facione (1990) developed a representation of the ideal critical thinker as part of the Delphi Report, in which she claimed a critical thinker must be a person who is inquisitive, open-minded, flexible, has a desire to be well-informed and has the ability to suspend judgment in order to consider alternate perspectives on important issues. In addition, Lewis and Smith (1993) and Sternberg (1986) focus on the thinker's ability to conform to the formal rules of logic, which, if done correctly, not only sets up the perfect conditions for critical thinking, but will also produce superior behaviors, actions and products of the thinker as each will be at its best within the confines of the formal rules of logic.

Philosophy scholars in the 1970s introduced informal logic as a specialized branch of logic that focuses on the development of skills and techniques for the critical evaluation and coherent presentation of arguments in a way that is sensitive to the contexts in which they occur (Fogelin, 2005). Furthermore, informal logicians, such as Johnson (1996), tend to analyze critical thinking in a broader sense and incorporate

competencies outside the field. Johnson sifted through the many definitions of critical thinking and found common threads, including:

> A reflective skeptical or questioning attitude, a sensitivity to value- or ideology-laden assumptions, an insistence on appropriate supporting grounds before accepting disputable claims, an appreciation of the various criteria applicable to good reasoning and argument (whether general or subject dependent), skill and judgment in the analysis and evaluation of claims and arguments, and a disposition to be self-reflective, sensitive to one's own possible biases or assumptions. (Johnson, 1996, p. 46)

Obviously, in Johnson's philosophy-based analysis, he has placed emphasis on the skill of informal logic and the need to develop and exercise that skill.

Modern day scholars, such as Possin (2008), a philosopher who is widely known for his critical thinking theory, describe the "dichotomy among scholars, many of whom believe critical thinking is basically formal logic, while those at the other end of the spectrum believe it is simply meta-cognition, or merely reflecting on what one happens to be thinking or experiencing" (p. 203). In one of his earlier works, Possin (2002) extrapolated a definition of critical thinking in which he declared that critical thinking is the "practice of requiring, assessing and giving cogent reasons for one's beliefs, values and actions" (p.12). Other philosophy scholars have attempted to define critical thinking and have developed similar definitions. Paul and Elder (2001) wrote that critical thinking is thinking "in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them" (p. xx). Whatever definition is upheld, most likely it includes the notion that

critical thinking is a deeper, more reflective type of thinking that is done for the betterment of the whole.

Several definitions from philosophy scholars work well with this dissertation, given its methodology, because they embrace both philosophical and cognitive approaches to critical thinking. Had this project relied solely on philosophy, Paul's 1992 definition of critical thinking would rank highest amongst the many because it is widely accepted amongst philosophers, but unlike many philosophers and informal logicians, Paul has avoided many of the technical aspects of logic (taxonomies, explanations of concepts, and breakdowns of argument analysis) and has focused on reasoning in everyday situations and incorporated work from multiple academic disciplines.

Paul (1993) distinguished between what he called "weak sense" and "strong sense" critical thinking, interjecting moral concern, pervasive bias, and egocentric thinking into his theory. He expanded this notion by making the distinction between sophistic and true critical thinkers. Sophistic, or weak sense, thinkers are those who attempt to use critical thinking skills to defend their own interests by uncovering fallacies in the arguments and reasoning of others instead of applying those same skills to their own arguments. True critical thinkers are unbiased thinkers who apply thinking skills to their own argument in order to find the truth.

Paul certainly was not the first philosopher to posit that the purpose of critical thinking skills is to find the truth. Truth is abundantly emphasized in the education and liberation of the mind throughout Plato's *Protagoras* and *Republic.* The ancient philosophers were worried that young minds may be ruined by those who do not seek the truth and that subpar education would lead young people to live less than virtuous lives.

In fact, according to Socrates in Plato's *Republic*, knowledge of good is the ultimate virtue, without which the attainment of other virtues is impossible. In order to be deemed morally excellent, Socrates believed it is important to possess the virtues of wisdom, courage, moderation and justice, and possessing any of those virtues is impossible without the sturdy foundation provided by liberal education and critical thinking skills (Grube, 1992, p. 4.427d). Furthermore, according to Adler (1959), a highly touted supporter of developing critical thinking skills through liberal education, "critical thinking goes beyond simply parting facts, nor is it solely concerned with the development of cognitive skills, but instead, liberal education makes good men and good men act nobly" (p. 2). Good men who act nobly will certainly live the virtuous lives discussed by Socrates.

Like Adler, Paul (1993) has recognized that critical thinking can be defined in numerous ways, and although those definitions may differ, they should not be seen as mutually exclusive of a particular discipline. Paul (1993) attempted to bridge the gaps between the disciplines by providing a multipurpose definition of critical thinking in which the thinker is "thinking about thinking while thinking to make their thinking better" (p. 91). Paul further wrote that critical thinking is:

> A unique kind of purposeful thinking in which the thinker systematically and habitually imposes criteria and intellectual standards upon the thinking, taking charge of the construction of thinking, guiding the construction of the thinking according to the standards, assessing the effectiveness of the thinking according to the purpose, the criteria, and the standards. (Paul, 1993, p. 21)

Both of these definitions focus on the metacognitive principles of critical thinking and the importance of assessing critical thinking, either one's own or that of one's interlocutor, to weed out bias, unrecognized assumptions or the irrationality that most people infuse into argumentation.

Others, such as Resnick (1987), have developed philosophy-based theories of critical thinking that seek to guard humans against their natural tendencies toward accepting fallacies and drawing inappropriate conclusions because it is less taxing than the effort needed to, as Paul (1993) would write, be a strong sense thinker.

Psychology-Based Definitions

Unlike the philosophers, those in psychology who have studied critical thinking skills have done so mainly from a developmental and/or cognitive theoretical approach. Hanley (1995) described the "two components of critical thinking as maximizing the efficiency and accuracy of one's cognitive and metacognitive skills" (p. 68). Unlike many cognitive theorists, Halpern (1996) has employed the term "critical thinking" instead of "thinking skills," which is popularly used to label the higher-order thinking skills that most philosophers label as critical.

Cognitive and developmental psychologists (Halpern, 1996; Choi, 2004; Levy, 2010), as opposed to those in the philosophy community, are more apt to find that critical thinking is a subset of, or on the same level as, problem solving. Halpern (1996), as an example of a psychologist's approach to critical thinking, has defined critical thinking as "thinking that is purposeful, reasoned and goal directed. It is the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions" (p. 5).

Halpern (2007) wrote that "the main component of critical thinking is the conscious reflection on the process of thinking and the evaluation of one's own thinking process" (p. 11). Like Halpern, other psychologists, by and far, have emphasized the cognitive skills involved in thinking critically; however, a growing dimension of psychologists recognize the disposition of the thinker, as well. Sternberg and Grigorenko (2007) noted that most within the psychology discipline view critical thinking in terms of skills, but they also not that "attitudes, or dispositions, are at least as important as skills. Someone may have the skills needed to think critically, but simply fail to apply these skills to the problems he or she confronts" (p. 295). Bensley, Crowe, Bernhardt, Buckner, and Allman (2010) used the growing body of critical thinking research in psychology to formulate a definition in their recent article on teaching and assessing critical thinking skills:

> We defined critical thinking as reflective thinking involved in the evaluation of evidence relevant to a claim so that a sound conclusion can be drawn from the evidence (Bensley, 1998). CT requires both skills in using rules and criteria for making reasoned judgments (Lipman, 1991) and the dispositions to use those skills (Halpern, 1998). (Bensley et al., 2010, p. 91)

Willingham (2007) has also defined critical thinking, but his definition seems to pull from both philosophy and psychology. He notes that the important aspects of critical thinking are "seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems, and so forth"

(p. 8). Willingham is perhaps most adamant about the two disciplines coming to a consensus in order to appropriately define critical thinking.

An Attempt at Consensus

Although philosophers and psychologists disagree as to what exactly the term critical thinking entails, most researchers agree on some foundational facets of critical thinking, most of which regard the various behaviors and/or dispositions that a critical thinker must possess. Behaviors include the ability to analyze evidence or arguments (Ennis & Weir, 1985; Facione et al., 1996; Facione, 2000; Halpern, 1998; Paul, 1992; Paul & Elder, 2002). In addition, many researchers across various disciplines believe that a critical thinker must be well versed at making inferences and successfully master various types of logic (Ennis & Weir, 1985; Facione, 1990; Paul, 1992; Willingham, 2007), as well as making sound judgments or evaluations when presented with an argument (Adler, 1982; Case, 2005; Facione, 1990; Facione, 2000; Lipman, 1988; Tindal & Nolet, 1995). Finally, many scholars also believe that true critical thinkers must have the ability to make sound decisions and be adept at problem solving (Ennis & Weir, 1985; Case, 2005; Halpern, 1998; Willingham, 2007). Other critical thinking abilities that are generally accepted by the various disciplines include identifying assumptions (Ennis & Weir, 1985; Facione, 1990; Paul, 1992) and interpreting and explaining different issues (Facione, 1990; Paul & Elder, 2002), reasoning verbally, and viewing an argument from multiple angles (Ennis & Weir, 1985; Paul & Elder, 2002; Willingham, 2007).

Furthermore, in addition to appropriate behaviors, critical thinking dispositions are also a critical facet that have been recognized by both disciplines (Facione, 1990).

Scholars generally agree that critical thinkers must be open-minded and fair-minded (Bailin, Case, Coombs, & Daniels, 1999; Ennis & Weir, 1985; Facione, 1990, 2000; Halpern, 1998). In addition, other behaviors deemed critical by both academies include the desire to reason (Bailin et al., 1999; Ennis & Weir, 1985; Paul, 1992; Willingham, 2007) and be well informed (Ennis & Weir, 1985; Facione, 1990; Paul, 1993).

Although various disciplines, namely psychology and philosophy, continue to disagree over the various behaviors and dispositions a critical thinker must possess, one major attempt has been made to synthesize the study of critical thinking across the disciplines. The American Philosophical Association conducted a multi-disciplinary investigation into which facets of critical thinking are universal in an attempt to achieve a consensus definition of critical thinking for the purposes of instruction and assessment (Facione, 1990). The 46 experts who were summoned for this task and who produced the subsequent report, commonly known as the Delphi Report, were called from a variety of disciplines, including more than half (52%) from philosophy, while 22% were from education, 20% from the social sciences, including psychology, and about 6% from the physical sciences.

Facione (1990), in the Delphi Report, defined critical thinking as "one among a family of closely related forms of higher-order thinking, along with, for example, problem solving, decision making, and creative thinking" (p. 13). The participants who joined together to provide the substance of the Delphi Report were able to reach a consensus on critical thinking and provided the following elongated statement:

> We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation

> of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Critical thinking is essential as a tool of inquiry. As such, critical thinking is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, critical thinking is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing critical thinking skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society. (Facione, 1990, p. 2)

This 187-word statement shows that the disciplines were able to work together to form a consensus on what constitutes critical thinking. However, because the statement is so long and includes so much in terms of cognitive and affective domains, the reader can get a sense of the debate and tension within the process (Facione, 1990). Although a consensus was reached, the debate will certainly continue, especially in the realm of undergraduate education.

Liberal Education and Critical Thinking Skills in American Undergraduate Education

Post-secondary education in America was originally patterned after the offerings of the medieval university, a pattern that persisted with great success since its creation around the year 1200 in Paris, Oxford, and Bologna. The medieval university curriculum was bi-level in nature and centered on the *trivium* (grammar, rhetoric, and logic) and *quadrivium* (arithmetic, geometry, astronomy, and music). All students were required to take the same courses to meet graduation requirements. At the medieval university, students explored higher-order skills, known as majors today, only during graduate studies, which were then limited to medicine, theology, and law. In explaining his Idea of a University, which is modeled after the Medieval university, Newman (1852) posited that liberal education should not be contrasted with the word 'useful', as is commonly done; instead, he determined that cultivating the intellect is an end distinct and sufficient in itself. Newman posited that a child's business when he or she goes to school is to learn and store up facts and that the child's intellect is little more than a receptacle for storage. However, upon passing from school to the university, students are moving from storing intellect to cultivating knowledge through liberal education and the development of critical thinking skills, which for Newman is the "indispensable condition of expansion or enlightenment of the mind" (p. 130).

A pivotal point in the history of higher education is when Harvard University instituted the nation's first undergraduate elective system in 1900 after a proposal published by then-president Eliot (1899) in the *Atlantic Monthly*. Arum and Roksa (2011) note that the effects of Dr. Eliot's decision to move to an elective-based system

are being felt today as expressed by the comments of former Harvard University President Bok (2006) in which he pointed out that "many students graduate college today without being able to write well enough to satisfy their employers, reason clearly or perform competently in analyzing complex, non-technical problems" (p. 3). Dr. Bok's comments are supported by the aforementioned AACU (2005) and Educational Testing Service (ETS, 2010) studies that showed that American college students are lacking such skills.

Granting college degrees to students with minimal critical thinking skills only dilutes the worth of the degree and downgrades the overall need for higher education as illustrated by Halpern (2007). Halpern notes that undergraduate students are able to *earn* a college degree without making any gains in their critical thinking ability by asking the reader to consider a developmental psychology course that may be found at almost any post-secondary institution in the United States. The professors of such as class could ask the students to list each stage of Piaget's theory of cognitive development, including the age range for each stage and an example of a cognitive task that somebody within that age range should be able to accomplish. Halpern explained that, although there is an opportunity to provide an example in the answer to this question, the answer still only requires basic recall because the example provided on the exam will most likely be the example that was presented in class. "If this is the extent of students' knowledge, they are unlikely to be able to use Piaget's conceptualization of cognitive development in any applied setting" (Halpern, 2007, p. 1) and have thus made no gains in the development of their critical thinking skills.

Part of postsecondary education's contemporary role no doubt is to impart specific subject-matter knowledge in the form of courses leading to a specialized degree; however, higher education should not abandon its role in fostering general intellectual or cognitive competencies and skills, which are certainly lacking in the aforementioned example provided by Halpern (2007). Pascarella and Terenzini (1991) have noted that "These cognitive skills go by a number of different names, such as reasoning skills, critical thinking, intellectual flexibility, reflective judgment, cognitive complexity, etc… and they differ somewhat in the types of problems or issues they address" (p. 114). The terms offered by Pascarella and Terenzini embrace the notion that these skills can be used in a variety of situations, so when they are not developed, as in the developmental psychology example, the learner will not be able to utilize the knowledge learned in that class with theories learned in other classes or even in situations presented in everyday life. Thus, although today's college and university students are steeped in the concepts of their areas of specialization, the applicability of those concepts in real-world situations is lost. These students are receiving college degrees without knowing how to properly apply such concepts to varying situations.

For Socrates and his young interlocutor in the aforementioned cave allegory, Socrates makes it clear that every man has the ability to 'know', but true knowledge is that which is focused on the truth. Socrates is showing Glaucon that the knowledge given to the young is more training than anything else; therefore, the purpose of higher education is to teach learners how to independently arrive at the truth by opening up to them the entire reality of the world. This reality may be more readily available through the various integral facets to liberal education, and it is upon this philosophy of liberal

education of the mind in the pursuit of truth that the American college and university were originally built.

Although the first American colleges and universities were built upon a foundation of liberal education, the current state of affairs proves that students are not taught to independently arrive at the truth, as were the philosopher-kings in Plato's *Republic* who would one day run the cities. "Many students come to college not only poorly prepared by prior schooling for highly demanding academic tasks, but – more troubling still – they enter college with attitudes, norms, values and behaviors that are often at odds with academic commitment" (Arum & Roksa, 2011, p. 3). Most students, according to Schneider and Stevenson (1999), enter college "with high ambitions, but no clear life plans for reaching them… they have limited knowledge about their chosen occupations, about educational requirements, or about future demand for these occupations" (p. 7).

Many colleges and universities, and the academic departments within them, do not make it a priority to inform students of employment trends or educational requirements for specific careers. Instead, each fights for students in order to maintain high enrollment and graduation rates as a means of staying relevant to the authorities who provide funding. At the time President Eliot was instituting the elective system at Harvard, Father Timothy Brosnahan (1990), President of Boston College, wrote about the dangers of such a system in the January 13, 1900 issue of the *Sacred Heart Review:*

> The young man applying for an education is told to look out on the whole realm of learning, to him unknown and untrodden, and to elect his own path. To do thus with judgment and discrimination, he must know the end he wishes to reach; he must moreover know himself – his mental and moral characteristics, his aptitudes,

> his temperament, his tastes; and finally, he must know which of the numberless paths will lead him to the goal of his ambition… He is "strongly urged to choose his studies with the utmost caution and under the best advice." But these provisions do not modify the general character of the system. He must distinctly understand that it is no longer the province of his Alma Mater to act as earthly province for him. Circumstances have obliged her to become a caterer. Each student is free to choose his intellectual *pabulum* (nourishment), and must assume in the main the direction of his own studies. If he solves the problem wisely, to him the profit; if unwisely, the same *Alma Noverca* (Step-mother) disclaims the responsibility. (Brosnahan, 1900, p. 9)

Ancient philosophers and Father Brosnahan (1990) were ignored in their warnings about the consequences of eliminating liberal education. Boning (2007) argued that liberal education was splintered by Eliot, and by the mid-1900s, little continuity remained between the courses required for a college degree earned by different students at the same institution.

Father Brosnahan (1990) was fighting against specialization and the establishment of a set of general education requirements that can be found in most undergraduate college and university catalogs today. The general education posed in Newton's (2000) Scholarly Discipline Model represents an attempt to preserve a remnant of liberal education through the development of a collection of courses that provide students with an array of studies to expand their knowledge base and hone their problem solving, interpersonal, and oral and written communication skills, as well as their cultural and linguistic literacy (Jones, Hoffman, Ratcliff, Tibbets, & Click, 1994). Colleges and

universities have outlined their general education requirements in various ways. Gaff and Wisescha (1991) found that most institutions require two writing courses, one math course, four courses in the humanities, a single fine arts course, two courses in the hard sciences, and three courses focusing on the social sciences. However, Latzer (2004) noted that even those courses are being cast aside because of student demand and the increasing call for faculty members to teach within their areas of specialization. Newton (2000) pointed out that this has had a profound effect on college and university faculty:

> The general education program is a reflection of a college faculty's perceptions, interests and ambitions. The rise of specialization and departmentalization has had a profound effect on faculty roles in leading universities nationwide. Primary identification and loyalty have shifted from the university to the professional specialty. The most significant reference group has become other members of one's discipline rather than one's university colleagues, and the department has supplanted the university as the primary source of authority and rewards. Researching teachers have been replaced by teaching researchers. Specialists with only passing interest in knowledge outside their disciplines have supplanted faculty who were not intimidated by involvement in integrative programs that took them beyond their specialties. (Newton, 2000, p. 168)

This trend only leads to an increasingly watered down core curriculum in which students are forced to listen to a 'sage on the stage' who feels mandated to teach lower-level courses and either expressly, or not expressly, limits the amount of discourse allowed. Newton (2000) wrote that "with little attraction and few rewards for senior faculty, especially in larger universities, general education courses have often become the

domain of graduate students and part-time teachers" (p. 168), which only serves to reinforce the notion amongst faculty and undergraduate students that general education is simply a set number of courses to get out of the way before the real work in their area of specialization can begin.

Students who are exposed to liberal education will naturally awaken their invaluable critical thinking skills in a teacher/interlocutor situation in which the teacher and students are free to engage in dialogue with each other. Professors who embrace a teacher/interlocutor relationship, much like those relationships that are an integral part of liberal education, will certainly do more to impact a student's life than will a professor who provides a wide range of theory and then mistakes rote memorization skills for learning, or even worse, a professor who purposely refuses to acknowledge the differences between rote memorization and true learning. Newman (1856) described the university as the following:

> A place to which a thousand schools make contributions; in which the intellect may safely range and speculate, sure to find its equal in some antagonist activity, and its judge in the tribunal of truth. It is a place where inquiry is pushed forward, and discoveries verified and perfected, and rashness rendered innocuous, and error exposed, by the collision of mind with mind and knowledge with knowledge. (p. 16)

Those collisions certainly are restrained, if not nonexistent, in large lecture halls where the lessons revolve around the truth as found by others instead of the truth found by the very students in the room through liberal education, which includes the examination of primary sources and the use of Socratic dialogue in the classroom.

Today's students learn in an environment in which sound bytes and opinion often are mistaken for rational discourse and facts. Nussbaum (2010), a Professor of Philosophy at the University of Chicago, has relied on Thucydides' example of people who are too easily influenced by moving rhetoric and bad arguments. Thucydides told the story about the fate of the rebellious colonists of Mytilene. Under the influence of the demagogue Cleon, who spoke to them of slighted honor, the Assembly voted to kill all of the men of Mytilene and to enslave the women and children. The city sent a ship to Mytilene with such orders; however, after another orator, Diodotus, calmed the people and urged mercy, the city was forced to send a second ship to stop the first. Much in the way the Assembly voted to kill all of the men of Mytilene without rational discourse on the situation, undergraduates may wholeheartedly accept what is taught in the classroom with little or no thought, namely because what is taught has come from a source they believe they can trust. Nussbaum (2010) rightly has pointed out that "irresolution is frequently compounded by deference to authority and peer pressure and that people are easily swayed by the fame or cultural prestige of a speaker, or by the fact that the peer culture is going along with the speaker's ideas" (p. 50), which is why universities promoting lecture halls with a sage on the stage and reliance on textbooks are dangerous to students and the overall learning process. Nussbaum (2010) continued by noting that such influence is not a danger when people are engaged in Socratic dialogue of critical inquiry. "The status of the speaker does not count; only the nature of the argument" (Nussbaum, 2010, p. 51).

Finding an army of modern-day scholars who see both the benefits and dangers of liberal education is not difficult. Current theories supporting liberal education are similar

to those that have been held throughout history. Humphreys (2006) has defined modern-day liberal education to include, among other attributes, "creative thinking, teamwork, problem solving, civic knowledge and engagement, ethical reasoning and action, synthesis and advanced accomplishment across general and specialized studies" (p. 3). Whereas the pre-20th-century scholars mentioned did not include much discussion of creativity, teamwork or advanced accomplishments across specialized studies, plenty of scholars agree that the goals of modern-day liberal education need to include such progressive ideas if it is to survive at all.

Bereiter (1997), an education researcher and professor emeritus at the Ontario Institute for Studies in Education at the University of Toronto, has welcomed a transformation of liberal education that includes a careful synthesis of new ideas and enduring principles. Bereiter recognized the need to retool liberal education because it will not survive in a globalized society with rapid technological changes. It is imperative, according to Bereiter, that "schools transform into workshops for the production of knowledge" (p. 2). Liberal education, in his view, needs to transform into a knowledge society organized around the production of knowledge in the same sense that an agrarian society is organized around agriculture production and an industrial society is organized around manufacturing. Bereiter's theory of liberal education coincides with what Humphreys (2006) called for, namely, "the abandonment of bureaucratic structures in which a worker's responsibility is defined by routine tasks and where nonroutine problems are referred to a higher level" (Bereiter, 1997, p. 6). Bereiter calls for replacing such structures with mission-oriented teams that solve problems and generate new knowledge within working groups. These are skills (creative thinking, teamwork,

problem solving, synthesis and advanced accomplishment across general and specialized studies) that can be used across employment disciplines much in the same way that critical thinking developed by liberal education can be used across educational disciplines. Such skill is important when competing for employment in the ever-changing, technology-laden, employment market of the 21st century and existing in the knowledge-driven economy that demands the development of a highly-educated workforce that can adapt to change and is viewed as essential for future prosperity (Harvey, Moon, & Geall, 1997).

In his article, Bereiter (1997), in his quest to promote the development of new knowledge, seemingly endorsed Socratic dialogue, which is at the center of traditional liberal education. Although Bereiter felt as if he were introducing a retooled version of liberal education, his ideas fall right in line with what Socrates promoted in all of his teacher/interlocutor interactions, namely, the development of critical thinking skills that can be used across disciplines in a manner that prepares students to use those skills in all aspects of life. Nussbaum (2010) notes that all undergraduates are required to pass a set of courses in philosophy and other subjects in the humanities because "such courses will stimulate students to think and argue for themselves, rather than to defer to tradition and authority" (p. 48).

Nussbaum (2002), perhaps one of the most ardent supporters of liberal education and the humanities, has expressed fear that the "illumination and human understanding that the humanities have given, and are still giving, to our undergraduates and our culture, may gradually be lost to the university's bottom line" (p. 47). Unlike Martin (1994), who felt that liberal education is the enemy of feminist studies, Nussbaum (2002) has

embraced liberal education because of the "positive influence it provides on the role feminist, gender, racial and ethnic subjects have in society as liberal education serves as the adhesive that holds together these different disciplines and teaches us to live together with dignity as rational animals" (p. 39). The problem with liberal education is that people try diligently to avoid its challenges. People, according to Nussbaum (2002), "buy into intellectual strategies aimed at turning away from the reality of our human lives and we comfort our minds with reductive pseudo-sciences that fool the mind into thinking it is elegant and active, while in truth it is lazy and evasive" (p. 39). The fooled mind, which is the product of a lack of liberal education and of the critical thinking skills liberal education helps to develop, poses a danger to more than just higher education; in fact, according to Nussbaum (2002), public policy made without the influence of the humanities is likely to be cramped and crude. The cultivation of the imagination that comes with the "study of literature, the cultivation of the ethical sensibility that comes with the study of philosophy and religion, these are essential equipment for citizens and policy makers in a world increasingly united, and driven forward, by profit motive" (Nussbaum, 2002, p. 48). Nussbaum (1997) also posited that "we have not produced truly free citizens in the Socratic sense unless we have produced people who can reason for themselves and argue well, and who understand the difference between a logically valid and logically invalid argument" (p. 35), all of which are the products of liberal education.

Martin (1994), perhaps liberal education's most influential critic, described liberal education as a "theory of curriculum that is seriously deficient" (p. 171) and perhaps outdated as it was built to be a service to men; therefore, liberal education is an affront to

the feminist movement because of its inherent gender bias. This gender bias is obvious in that the "intellectual disciplines into which a person must be initiated to become an educated person *exclude* women and their works, *construct* the female to the male image of her and *deny* the truly feminine qualities she does possess" (Martin, 1981, p. 101). Liberal education, according to Martin (1994), does not connect with women because such curriculum "ignores feelings and emotions and other so-called 'non-cognitive' states and processes of the mind. It also ignores 'knowing how', it excluded education for action and it relies on a conception of education that divorces mind from body" (Martin, 1994, p. 186). Martin (1994) further argued that women cannot separate their minds from their bodies as can men; therefore, this divorce of mind and body is one of the biggest challenges and frustrations for any woman who chooses to pursue a degree that includes any traditional humanities-based coursework.

The field of scholars clamoring for improved critical thinking skills amongst students is growing well beyond those in the humanities. The business college at the University of West Florida, on behalf of the Association to Advance Collegiate Schools of Business, was given the task in 2002 of developing an assessment instrument that measures business students' critical thinking ability. The faculty and administration settled on the development of a summative capstone course to assess critical thinking skills based on the work of Maki (2004). The capstone course revolved around students solving unstructured problems with no single correct answer, namely in the form of case analyses that culminated in a written case intended to demonstrate the student's level of business understanding and ability to apply best practice business concepts in varying situations. After the first few rounds of the capstone experience, the business faculty

realized that students were completing the program without any meaningful gains in their critical thinking ability, which led the faculty to investigate expanding the capstone project over the entire course of a student's undergraduate career (Peach & Mukherjee, 2007). By the end of the project, the faculty "found that meaningful assessment is a continuous process that requires sound research, documentation, interventions and an allocation of significant academic resources" (Peach & Mukherjee, 2007, p. 4), but in the end, such an investment of time and resources is critical in producing highly-regarded business students.

The need for improved critical thinking skills amongst college and university undergraduates has not escaped faculty members in the so-called hard sciences either. Researchers in the science programs at the University of Florida have begun to call for a move toward fostering their students' critical thinking abilities instead of simply measuring their penchant for rote memorization. In science, inquiry-based learning, which is much like Socratic dialogue, is the preferred instructional method used to facilitate cognitive development in students. The popularity of inquiry-based learning at the University of Florida stemmed from a federally-funded grant project initiated in 2000 to develop an instructional model and skills assessment instrument for teaching and evaluating critical thinking skills in undergraduate biology courses at the university. The program at the University of Florida flourished because the students who were exposed to the instructors who overtly taught critical thinking and inquiry-based learning had significantly higher gains in their critical thinking skills than their counterparts in classes focusing on rote memorization (Friedel & Irani, 2008). However, because the scope of the research is limited, and because the study has not been replicated, the authors only

cautiously recommend inquiry-based teaching at the university until more data become available.

Pittendrigh (2007) detailed Montana State University's steps toward more liberal education, the primary element of which was their adoption of a canon of books to be read by all first-year undergraduates in a seminar-style class utilizing Socratic dialogue. This is extraordinary because MSU, a mid-sized public university with approximately 12,000 students, 800 faculty members and a thriving research program, is not the type of institution typically associated with such a move. Liberal education usually is reserved for small liberal arts colleges with small or nonexistent research agendas and strong humanities programs. Nevertheless, although Montana State University retained the specialized degrees they offered, "the university succeeded in replacing a cafeteria style core curriculum with a new curriculum, CORE 2.0, focused on student learning, inquiry and research. The process of revising the general education curriculum took six years, from 1998 through the implementation of CORE 2.0 in 2004" (Pittendrigh, 2007, p. 35). Although CORE 2.0 more closely mimics Newton's Scholarly Discipline Model, this example shows that even large universities have recognized the need to improve their students' critical thinking ability and their understanding that they can rely on liberal education to do so.

According to Pittendrigh (2007), CORE 2.0 was established to improve critical thinking and communication skills, as well as to encourage active engagement and an understanding of diverse perspectives. As part of CORE 2.0, the university instituted a freshman seminar class with a reading list that included Plato's *Apology*, Galileo's *Letter to the Grand Duchess Christina*, Jonathan Winer's *Beak of the Finch*, and Leslie Silko's

novel *Ceremony*. Unlike the core curriculum at many colleges and universities, Pittendrigh (2007) noted that the "faculty were clear that the Letters and Science seminar should be intellectually challenging, should incorporate perspectives from the three broad disciplinary areas in the college—humanities, social sciences, and natural sciences—and should be taught by tenured and tenure-track faculty" (p. 36).

The faculty quickly recognized the importance of offering high-quality education to MSU students from the start, and that led to a sense of common purpose amongst faculty from different disciplines. Pittendrigh (2007) explained that the faculty members were encouraged to shed their status as experts in their fields and to collaborate with their colleagues and the students in order to facilitate learning amongst everyone involved with CORE 2.0. The learning environment flourished as the faculty members were involved in interpreting the texts alongside the students and teaching the students to examine evidence and build supported arguments after asking meaningful questions. A real sense of collegiality was built as "the faculty met weekly to discuss course readings, engaging in cross-disciplinary conversations about course texts, ideas, and teaching. For many, the weekly staff seminar became one of the most enjoyable aspects of teaching the course" (Pittendrigh, 2007, p. 36).

Although the program at MSU is not true to the Great Books Model as defined by Newton (2000), the canon of texts, reliance on Socratic dialogue, collaboration and sense of community amongst faculty members, as well as the greater gains in critical thinking skills of the students, are certainly benefits of the Great Books Model. "Other benefits of CORE 2.0 included the development of skills in discussion, teamwork, and writing, as

students practiced applying intellectual skills to problem solving and decision making" (Pittendrigh, 2007, p. 55).

The work of both ancient philosophers and modern-day scholars makes clear that liberal education has a role in American universities that stretches beyond a decreasing core curriculum. Reducing liberal education is dangerous for colleges and universities as they vie for a portion of graduating high school seniors whose parents have a large role in their children's college selection. Parents are more likely to concern themselves with the quality of education provided by a particular school; however, on the issue of whether students learn better at one institution verses another, Olson (1994) found that "despite increased attention to student learning results by colleges and universities and accreditation agencies, parents and students have no solid evidence, comparable across institutions, of whether students learn more at one college than another" (p. 14). This may not be an immediate issue for colleges or universities in regards to the admissions process, as much of that process focuses on dazzling prospective students with an array of student activities, but if recent trends continue, one can expect to see liberal education "replaced by some form of vocationalism, in disguise perhaps, or migrate into other environments, such as Master of Arts in Liberal Studies programs, for adults who recognize what they missed in their undergraduate education" (Connor, 1998, p. 6).

Montana State University has discovered great value in a strong core curriculum and general education meant to provide students with a breadth of learning experiences and a broad knowledge base that sharpens the students' problem-solving, interpersonal, oral and written communication skills, and cultural and linguistic literacy (Jones et al., 1994). However, some schools, such as the University of Arkansas at Fayetteville's

Fulbright College of Arts and Sciences, plan to reduce its in order to make way for more specialized courses and to reduce costs by having faculty concentrate on their own areas of specialization while in the classroom (University of Arkansas, 2010). These two examples show that no consensus exists regarding the value of a strong core curriculum; the topic is generally in a state of flux. In fact, 57% of the 479 schools surveyed by Ratcliff, Johnson, La Nasa, and Gaff (2001) were restructuring their general education programs, with many more planning to follow suit. Post-secondary institutions struggle to build solid general education programs using introductory courses from various academic departments because seasoned professors prefer not to teach lower-level courses (Aloi, Gardner, & Lusher, 2003). The faculty at Montana State University prioritized the use of tenure or tenure-track professors in their core curriculum program to help ensure that the quality of the program did not fall by the wayside and that the faculty members recognized that the program was invaluable.

Strategies and Methods of Developing Undergraduate Critical Thinking Skills

Specific instructional strategies, such as those including a high level of student and instructor interaction, are central themes to developing critical thinking skills in undergraduate students. For instance, several researchers have found that improving an undergraduate's critical thinking skills requires explicit instruction (Case, 2005; Facione, 1990; Halpern, 1998; Paul, 1992). Another instructional technique, collaborative learning, is mentioned throughout the research as one that in instrumental in developing critical thinking skills (Heyman, 2008; Paul, 1992; Thayer-Bacon, 2000). Dillenbourg, Baker, Blaye, and O'Malley (1996) used their work to highlight that these instructional strategies rely upon the social interactions produced in the classroom to enhance the

participating students' critical thinking skills. Bailin et al. (1999) supports the work of Dillenbourg et al. (1996) and argues that the ability to respond constructively to others during a group discussion is fundamental in the development of critical thinking skills.

According to Bloom (1956), education scholars have formulated a multi-part process by which students learn, which has been standardized to include six basic learning objectives, including knowledge, comprehension, application, analysis, synthesis, and evaluation. Furthermore, according to Weisel (2009), critical thinking skills take students beyond memorization, comprehension, and application of facts. "Students must be able to analyze certain situations using information they know as well as the information that is still needed that a well thought out conclusion can be reached. Synthesis and evaluation are integral to the development of critical thinking" (Weisel, 2009, p. 161).

Weisel (2009) developed a study in which she sought to determine whether critical thinking skills can be taught successfully in an introductory business class in what seems to be an answer to both Bereiter (1997) and Humphreys (2006) who make calls to institute various facets of liberal education in specialized courses. Her hypothesis was that these skills can be taught by focusing on specific issues through the development of the ability to analyze problems. Weisel's (2009) research model included introducing critical thinking skills using a four-part rubric that scored the ability to develop facts, determine missing information that would be helpful in making a decision, analyze ambiguities present in the fact pattern that might impact the decision, and, finally, to reach a conclusion. Although her technique for teaching critical thinking skills has not been researched, Weisel (2009) found that there "were statistically significant gains in the

critical thinking ability of those students who were part of the treatment group, which included a 37% gain in the number of students who could identify any missing information in the exercises" (p. 166).

Kaul and Pratt (2010) described how learning communities featuring collaborative inquiry and discovery helped to improve their students' critical thinking abilities; however, their study lacked an instrument to measure any gains in such abilities, a common weakness among studies with this aim. Halpern (1993) posited that weak assessment instruments contribute to many of the problems encountered when attempting to determine the effectiveness of various models for the development of critical thinking skills. Halpern argued that assessment instruments must be developed to measure slight increases in the critical thinking skills and dispositions of those being tested.

Assessing Critical Thinking Ability

Generally, two approaches exist for undertaking the challenging task of assessing students' critical thinking abilities outside of the laborious path of collecting and evaluating student portfolios (Possin, 2008). Those looking to assess students' critical thinking skills can either: 1) use commercially available standardized tests, or 2) design an assessment instrument that meets the needs of the particular project. In order to reduce validity and reliability issues, this researcher has chosen the commercially available Ennis-Weir Critical Thinking Essay Test over many others, such as the California Critical Thinking Skills Test, the Watson-Glaser Critical Thinking Appraisal, and the Cornell Critical Thinking Tests, all of which were considered.

While the California, Cornell, and Watson-Glaser tests are convenient in that they are multiple-choice tests and can be graded by machine, those tests cannot determine how

well a student has developed major facets of critical thinking ability, such as their ability to generate clear and well-reasoned written/oral arguments, nor can those exams determine a student's ability to resolve open-ended problems. Keeley and Browne (1986) questioned the validity of multiple-choice critical thinking exams as a whole because those taking the exams are not free to determine their own questions or apply their own evaluative criteria. In addition, two years later, Keeley and Browne stated that perhaps the best way to evaluate critical thinking skills is through student-generated written responses. For instance, although the Watson-Glaser test has been lauded for its validity and reliability (El Hassan & Madhum, 2007), Wagner and Harvey (2006) offer criticism because there is one section of the test that provides only two multiple-choice answers for each question, so success can be chalked up to guessing rather than critical thinking ability. Other scholars criticize multiple-choice exams because they do not allow for individual responses, which can lead to a lot of guessing, and "guessing what an anonymous writer of a test item had in mind isn't higher-order thinking" (Brady, 2008, p. 67).

Brady (2008) and Brunt (2005) both suggest that written responses, such as those produced by the Ennis-Weir test, require analysis, evaluation, argument and evidence, and therefore assesses higher-order thinking. The Ennis-Weir test was chosen from a host of others because, while no test can claim to fully measure all aspects of critical thinking ability, it seems to have been carefully crafted and recrafted to weed out issues of validity and reliability while testing the major aspects of critical thinking, namely, interpretation and analysis, the detection of fallacies and assumptions and inference (Ennis & Weir, 1985). In addition, a host of scholars have praised the Ennis-Weir test

because it requires the test-taker to employ higher-order thinking skills while formulating a written response, which is more thorough than multiple-choice exams (Dunitru, 2012; Oermann, 1999; Werner, 1991).

Conclusion

The academy has come together to establish a universal definition of critical thinking on at least one occasion; however, infighting continues within the academy, which has produced an infinite number of definitions for the term, most of which are based within either philosophy or psychology. Although scholars have had difficulty defining critical thinking, and although no consensus has been reached on how to best measure critical thinking skills, there is little argument that college students in the United States are graduating with critical thinking skills that have been refined during their post-secondary education.

The following chapter, Chapter 3, highlights the methodology and research design for this study, including details regarding the research sites, the various research instruments used by the researcher, and method of data analysis. Chapter 3 also includes details on participant recruitment, data collection and analysis procedures and participant profiles.

Chapter 3: Methodology

Overview

The purpose of this mixed methods study is to compare, using the Ennis-Weir Critical Thinking Essay Test, the critical thinking skills of students at two schools that use two different curriculums. The first school, Panther College in the Midwest, focuses on degree specialization while primarily relying on secondary sources in the classroom, and it offers bachelor's degrees in a variety of specialized disciplines. The second school, Burgundy College in New England, promotes liberal education by employing a canon of Great Books, primary sources and Socratic dialogue in the classroom and exclusively offers a bachelor's degree in liberal arts.

Upon assessing the students' critical thinking skills, and after controlling for their initial academic abilities by comparing individual college entrance exam scores, along with the sample population's mean high school and college grade point averages, the researcher combed the qualitative data gathered from the students to find any factors, such as patterns in their demographics, record of high school achievement, and study habits, which may contribute to any differences that may be found in the critical thinking ability of the two sample populations. Therefore, Chapter 3 serves as a summary of each of the following six parts of this study: 1) the post-secondary institutions involved; 2) the procedures used to recruit participants; 3) the recruited participants' demographics; 4) the Ennis-Weir Critical Thinking Essay Test; 5) the study design and data collection procedures; and 6) the analysis of the collected data.

The Research Sites

The researcher conducted this study at two private post-secondary undergraduate institutions, both of which have requested to remain anonymous throughout this dissertation and therefore are referred to as Panther College and Burgundy College, respectively. Panther College offers degree specialization and a core curriculum that was developed to enhance its students' critical thinking skills, while Burgundy College offers its students a strong liberal education curriculum focusing on the Great Books and because of its adherence to Socratic dialogue in the classroom. The researcher sought to measure a cross section of the students' critical thinking abilities at both schools and to gather qualitative data that may explain any differences between the sample populations' scores on the Ennis-Weir test. The researcher gathered data at Burgundy College in March of 2012 and at Panther in April of 2012.

Panther College[1]

Panther College is a small, independent, four-year, coeducational college affiliated with the Evangelical Free Methodist Church and located in a rural area of the Midwest, about an hour outside of a major metropolitan region. The college offers 55 different degree specializations, commonly referred to as majors, with dozens of emphases available within those specializations. Students are required to complete a minimum of 126 credit hours to complete a bachelor's degree at Panther College, including a number of general education requirements that vary depending on the degree sought. The college is accredited by the Higher Learning Commission of the North Central Association of Colleges and Universities.

[1] Citation information is excluded in this section to maintain the anonymity of the institution.

Panther College is considered small with a traditional undergraduate enrollment of 1,365 at the beginning of the 2011-2012 school year and a student-to-faculty ratio of 18:1. The college reports that 75% of its faculty holds doctoral or other terminal degrees. All students are required to complete general education courses, which consists of both a core curriculum and distribution requirements that are, according to the college, "designed to help students develop essential skills that are attributes of all well-educated people such as critical thinking and communication skills," as well as to "provide students with introductions to the humanities, the natural sciences, the social sciences and physical fitness." The school's curriculum is designed to instill in its students "knowledge and respect for the wholeness of God's creation and human efforts to understand that creation."

Panther College has published admissions standards; however, the freshman class of 2010, which is the most recent class for which completed information is available at the time of this study, exceeded those published standards. The class averages include an average ACT score of 22 and an average high school grade point average of 3.32. The overall student body is approximately 50% male, 77% Caucasian, 9% African-American, 3% Hispanic, 1% Asian, and about 10% listed as other. The college reported that 59% of its students attended public high schools, while 31% attended private high schools, and 18% were homeschooled. Only about 77% of the 1,087 students who applied for admission for the 2010-2011 academic year were admitted, and about 50% of those students enrolled. The college reported that 75.5% of the freshman class of 2010-2011 returned for the 2011-2012 academic year and that, overall, about half of their students

(49.4%) graduate within four years. Full-time tuition, mandatory fees, and room and board total $32,986 for the 2012-2013 school year.

Burgundy College[2]

Burgundy College is a small, Roman Catholic, coeducational college located in a rural area of New England about an hour outside of a major metropolitan region. The college offers a curriculum based on a close reading of the Great Books and relies on Socratic dialogue in the classroom as students work through the classical trivium and quadrivium while progressing through their four years on campus. The college only offers a bachelor of liberal arts degree; it is accredited by the American Academy for Liberal Education and is in the process of applying for accreditation through the New England Association of Schools and Colleges.

Burgundy College is small with an enrollment of 101 students and a student-to-faculty ratio of 11:1. Seventy-three percent of the Burgundy College faculty hold terminal degrees. The students at Burgundy College read an impressive list of Great Books (Appendix A) throughout their four years on campus, and all students follow the same schedule of courses (Appendix B), as the college does not offer electives. The college claims in its recruiting material that students will find "an integration of the very best of the 'Great Books' tradition – its devotion to reading and discussion of primary sources – with the strengths of Catholic humanistic studies." The college relishes its tradition of communicating more than factual data as the faculty open "a path toward an encounter with Truth itself leading to a fundamental transformation of lives."

There are no published admissions standards for Burgundy College; however, the freshman class of 2010, the most recent class for which information is available, had an

[2] Citation information is excluded in this section to maintain the anonymity of the institution.

average SAT/ACT score of 1946/24 and an average high school grade point average of 3.18. The overall student body is 58% male, 72% Caucasian, 9% African-American, 3% Hispanic, 1% Asian, and 5% listed as other. The college reports that 55% of its students attended public high schools, while 29% attended private high schools and 16% were homeschooled. Only about 68% of students who applied to Burgundy College for the 2010-2011 academic year were admitted, and about half of these admitted students ultimately enrolled for the fall semester. The college did not have solid retention rate statistics and was only able to tell the researcher that over 90% of students graduate within four years of matriculation. Full-time tuition, mandatory fees, and room and board total $23,000 for the 2012-2013 school year.

Developing the Instrument

Results obtained from four sources, the Ennis-Weir Critical Thinking Essay Test, a questionnaire, a project data sheet, and transcriptions from a series of face-to-face interviews with members of the sample populations, were compared in this study. The Ennis-Weir test examined the students' ability to interpret a primary document, in this case a faux letter to the editor, as well as their skills in formulating an analysis of the argument presented in the faux letter. The researcher sought volunteers to complete the Ennis-Weir test at Burgundy College in March of 2012 and at Panther College in April of 2012 in order to obtain a general cross section of the student body's critical thinking ability. The Ennis-Weir test was selected because it was designed to be used with students from the seventh grade through college (Ennis & Weir, 1985). The Ennis-Weir test also was selected because of its open-ended nature, which encourages test-takers to employ higher-order thinking skills, elicits their own interpretation of a faux letter to the

editor, and engages them in real-life problem solving efforts (ten Dam & Volman, 2004; Yeh, 2001).

Using an essay-format exam in lieu of a multiple-choice exam in which the correct answer is provided offers several advantages. The Ennis-Weir test requires students to formulate their own response, which should trigger their higher-order thinking skills more so than a multiple-choice exam (Oermann, 1999; Tomey, 1999). Another benefit of an essay exam is that it will produce an individual response, as such an exam requires the student to analyze and evaluate an argument and produce a counter-argument using evidence, which is more complicated than answering multiple-choice questions (Brady, 2008). As noted by Werner (1991), although various multiple-choice tests of critical thinking skills are highly regarded instruments, they cannot include the design, skill requirement, subjectivity, individuality and contextualization provided by essay tests, such as the Ennis-Weir test.

As noted in Chapter 2, because "critical thinking" lacks a widely accepted definition within the disciplines, scholars certainly are hindered from developing an adequate assessment instrument. This issue also may have prevented the authors of the Ennis-Weir test from addressing construct and other types of validity. Perhaps it is for this reason that the authors do not claim that the Ennis-Weir test measures "all skills included in the concept of critical thinking; nor do the authors make claim for predictive or concurrent validity since there is no outside criterion for the ability the test was designed to measure" (Ennis &Weir, 1985, p. 3).

Generally, scholars who have reviewed the Ennis-Weir test have responded favorably, but some reservations persist. Tompkins (1989), who praised the test's

realistic nature, wrote that the Ennis-Weir test certainly is functional as a test of critical thinking ability and praised the test as an "open-ended and content specific test that allows students to respond to the arguments presented in the test in a variety of ways" (p. 291). Tompkins also criticized the meager validity and reliability data offered in the Ennis-Weir test manual. Werner (1991) noted that "in assessing both evaluative and productive aspects of critical thinking, the test provides the evaluator with a holistic and naturalistic picture of critical thinking skills" (p. 495).

In addition to the aforementioned instrument, the students participating in this research were asked to complete a demographic survey. This survey, labeled as the project data sheet (Appendix C), was developed by the researcher and was used to collect information regarding each participant's age, gender, class standing, classroom performance, ethnicity, socioeconomic status, and program of study. This information, known as realist ethnography, is an objective method used by cultural and educational researchers to study the culture of an educational institution (Gay, Mills, & Airasian, 2006). In the case of this project, the information was gathered to equate the two groups of students, thus eliminating any possible alternative explanation for differences in test scores that could be attributed to demographic differences (Gay et al., 2006).

Furthermore, in order to control for any differences in the two populations' personal and/or academic histories, information regarding the personal and academic characteristics of the students, as well as the perceptions of the students' post-secondary institution, were gathered using a 28-item questionnaire covering a variety of questions related to students' pre- and post-college study habits, their perception of their critical thinking skills pre- and post-college, and their overall satisfaction with their education

(Appendix D). Assurance of face validity for the questionnaire was provided by three faculty members in the Instructional Leadership doctoral program at Lindenwood University.

The researcher asked the participating students whether they were willing to participate in a face-to-face interview with the researcher. A total of 12 students volunteered to participate, seven from Burgundy College (*n*=7) and five from Panther College (*n*=5). Those students who chose to participate in a face-to-face interview met with the researcher at a mutually agreed-upon date, time and location. The average interview length was 63 minutes, while the shortest was 28 minutes and the longest was 124 minutes. Upon the student's arrival at the previously agreed-upon location, the researcher reintroduced himself, thanked the student for his or her participation and described the research and its purpose using a prepared script. The researcher then offered the participating students time to examine and sign both the IRB approval form for this study and the informed consent document. The researcher then described how the interview was to be conducted using a prepared script.

The researcher then asked the student whether he or she was still willing to complete the interview. If the participant indicated an unwillingness to complete the interview, the process was terminated, the researcher thanked the student for his/her time and they parted ways. If the student indicated a willingness to complete the interview, the researcher asked the participant the following question and followed a thematic progression based on his/her answer:

What led you to enroll in this school and how do you feel your critical thinking skills have been impacted by your experience thus far?

If needed, the following questions were used in case the thematic progression from the initial question stalled:

1) What does critical thinking mean to you?

2) How has your undergraduate experience impacted your critical thinking ability?

3) How has your academic lifestyle changed from high school until today?

4) What kind of instructional methods have you experienced at this institution?

5) What kind of formative and summative assessments have you experienced at this institution (projects, essays, multiple choice exams, etc…)?

6) What kind of instructional methods and assessments do you enjoy the most?

7) What is the reason you chose this school over all others?

8) How do you feel about your overall undergraduate experience?

9) What do you plan on doing after college?

Upon concluding the interview, the researcher asked the student if the process had raised any questions the participant would like to have answered and then answered any

questions posed by the participant. The researcher then reminded the student that his/her identity would be protected and that the participant would not be associated in any way with the interview notes or recordings, which would be destroyed upon the conclusion of this research. The researcher thanked the student for his or her time, and the two parties parted ways. Debriefing not needed as the entire process remained anonymous throughout.

Classroom Observations

To ensure that the teaching methods at the two schools differed, the administration at each school granted the researcher permission to ask instructors whether they were willing to allow the researcher to conduct low-inference observations during their class sessions. In order to ensure that the instructors did not change their teaching methods in anticipation of the classroom visit, the researcher approached the instructors and asked for permission to observe their classrooms shortly before class was scheduled to begin. The researcher visited 11 classes over three days at Panther College and 12 classes over four days at Burgundy College. Only one instructor, an instructor at Panther College, denied the researcher access.

Method of Data Analysis

The hypothesis and research questions for this study, as previously stated in Chapter 1, were as follows:

Hypothesis: Undergraduate students enrolled in a school focusing on liberal education will achieve higher test scores on a standardized critical thinking exam when compared to the test scores of students enrolled in a school that focuses on degree specialization.

Null Hypothesis: No differences will exist between the scores on a standardized critical thinking exam between undergraduate students enrolled in a school focusing on liberal education when compared to the scores of students who are enrolled in a school that focuses on degree specialization.

Research Question #1: Are there differences in how students think about critical thinking between students who attend a school that focuses on liberal education versus students who attend a school that focuses on degree specialization?

Research Question #2: Are there important differences in any academic and/or personal characteristics of students who attend a school that focuses on liberal education versus students who attend a school that focuses on degree specialization that can explain any disparity in the critical thinking ability of the two populations?

To address these questions, several approaches to data analysis were used. The researcher conducted his research at Burgundy College from March 13 to March 16, 2012, and at Panther College from April 18 to April 20, 2012. The actual time spent by the researcher at each site varied to accommodate the schedules of the college, administrators, faculty, and students. Each site visit began with an initial 30-45 minute conversation with the administrator who was hosting the researcher on campus. The researcher then began asking faculty members for permission to recruit students at the beginning of class sessions and to conduct low-inference observations of the classrooms using the rubric included in Appendix F. The classroom visits ranged from 50 – 90 minutes each depending on the day of the week and the number of credit hours offered for each class. Each classroom visit concluded with a brief conversation with the instructor, and each site visit concluded with an unformatted exit interview.

The researcher employed the Ennis-Weir test, in addition to a series of observations, interviews, questionnaires, and the project data sheet, to allow for one tool to augment another tool in any case of data weakness. The collected qualitative data were organized and coded into interpretive categories as they were gathered, and the interviews were transcribed and each line numbered to aid in the coding of interesting phrases and possible behavior patterns. This followed a pattern established by Strauss and Corbin (1990) who defined the coding of qualitative data as "the process of breaking down, examining, comparing, conceptualizing, and categorizing data" (p. 61). As each interview and questionnaire was dismantled and labels were placed upon any events within the data, those events were grouped together to form developing categories. The developing categories were built upon keywords and were soon clustered into major categories containing several subcategories. The procedures used to analyze the data were uniform regardless of the type of data being reviewed, based upon the recommendation of Miles and Huberman (1994), who referred to data reduction as "the process of selecting, focusing, simplifying, abstracting and transforming the data that appear in written-up field notes or transcriptions" (p. 11).

The Ennis-Weir test manual provides a standardized scoring matrix (Appendix E) for each of the nine paragraphs written by the participants. According to this manual, students' scores can range from -9 to +29. The Ennis-Weir test manual recommends that the test be limited to 40 minutes; however, in pilot testing conducted by the researcher with students from a community college, it was found that most students completed the test within 30 minutes. The Ennis-Weir pilot test was administered by the researcher. The students were given the test without any preparation or coaching. Each essay was

scored twice, once by the researcher and again by a doctoral candidate at another university. No discussion occurred between the researcher and the doctoral candidate on how to score the essays; rather, they both followed the method of scoring outlined by the Ennis-Weir test manual and its accompanying scoring matrix. The essays were scored on the predetermined -9 to +29 scale. Any scored essay in which the difference between the researcher's and the doctoral candidate's given score was more than three points was discussed and rescored. The doctoral candidate and the researcher initially achieved an interrater reliability of .92 after scoring 25 pilot exams. Interrater reliability jumped to .96 after discussing and regrading the two Ennis-Weir tests that were beyond the acceptable three-point threshold.

Similar to the pilot testing procedures used at the community college, the essays provided by the sample population at Panther College and Burgundy College did not include any identifying information and were scored blind by the researcher and the doctoral candidate. The researcher turned over the completed research packets to a third party who removed the items from each packet and marked all of the items from the individual packets with a unique symbol to help ensure the pieces of each packet could be identified throughout the process. The packets completed by the Panther College students were each marked with a different letter from the alphabet. The packets completed by the Burgundy College students were assigned numbers by the third party. The marking system was not revealed to the researcher or the doctoral candidate until after all of the essays were scored and the data were recorded in order to help eliminate any scorer bias.

Data Collection and Analysis Procedures

Upon approval by the Lindenwood University Institutional Review Board (IRB), both Panther College and Burgundy College allowed the researcher to use an on-campus facility outside of students' classrooms to administer the Ennis-Weir Critical Thinking Essay Test, a questionnaire, and a project data sheet to any students who were willing to voluntarily participate. The researcher also was granted permission by the institutions to conduct interviews with voluntary participants on campus as well. In addition, the two schools used their campus-wide email systems to promote this research three days before the researcher visited each campus. In addition, the two schools forwarded the details of this research to their faculty members and encouraged the faculty to allow the researcher both to use a few minutes of class time to promote the project while the researcher was on campus and to conduct a low-inference observation in their classrooms.

The researcher also provided the students with the date, time, and location of the project on the classroom chalk/white board and the students were asked to note these details in their personal calendars. The researcher then thanked the instructor and the students for their time and left the classroom if the instructor had not agreed to allow the researcher to conduct a low-inference observation. If the researcher was allowed to conduct the observation, the researcher sat in an inconspicuous location in the classroom and remained for the duration of the class while making notes of the classroom activity on a rubric (Appendix F).

Quantitative Analysis Procedures

At the time the researcher was collecting data, he to conduct a series of Fisher's exact tests at the 0.05 level of significance on the demographic data provided by the

students, excluding age and family income level, to determine whether any statistically significant differences exist between the two sample populations. The researcher plans to conduct the Welch's *t*-test with a 0.05 level of significance on the students' age and family income level data, as the FET 0.05 is not an appropriate measure for quantitative variables. The Welch's *t*-test was chosen over the Student's *t*-test throughout this project because the variances of the two sample populations in this study are not equal, and the Welch's *t*-test was designed to negate any Behrens-Fisher problems, which are prevalent in Student t-tests when the variances of the two sample populations are not equal (Sawilowsky, 2002).

Participants

The accessible population for this study consisted of all undergraduate students at Panther College and Burgundy College. The researcher sought participants on a voluntary basis at each college through an announcement on the school's email system and through a brief introduction to the study at the beginning of several class sessions on campus. Eighteen students participated in the study at Burgundy College; however, although 16 students fully completed their research packets, two students requested in writing that their scores not be included in the study for unspecified reasons. Twelve students participated in the project at Panther College, with only 11 students fully completing the entire research packet. All 11 of the fully-completed research packets from Panther College, as well as the 14 acceptable packets from Burgundy College, are included for analysis in this dissertation.

The researcher collected demographic data from the students, such as gender, age, class rank, race/ethnicity, size of hometown, annual family income, major, full-time or

part-time status, type of high school attended, and academic information such as high school and college grade point averages and college entrance exam scores. This information was gathered to equate the two groups of students, thus eliminating any possible alternative explanation for the differences in test scores that could be attributed to demographic differences (Gay et al., 2006).

Panther College Student Profiles

The mean age of the sample population at Panther College was 20.636 years, and 55% of the participants were male. Sixty percent of the participants identified themselves as Caucasian, 30% as African-American and 10% as Hispanic. A total of 100% of the participants were full-time students, with one identifying as a sixth-year senior (9%), two as fourth-year seniors (18%), four as third-year juniors (45%), one as a second-year sophomore (9%), and two as first-year freshmen (18%). Only one student identified as an undecided major, while the others identified their majors as English (9%), social work (9%), ministry (27%), psychology (9%), business (18%), and education (18%).

Eighteen percent of the sample identified as being from a rural community with a population of under 1,000 residents, while two students (18%) identified as being from a medium-sized community with a population of 4,001 – 10,000 residents and as being from a large community with a population of between 10,0001 and 40,000 residents. The remaining participants in the sample identified as being from urban areas, with two students (18%) from small urban centers (40,001 – 100,000), one from a medium urban center (100,001 – 500,000), and three (27%) from large urban centers with populations of over 500,000 residents.

Nine percent of the Panther College sample identified as growing up in a household with an annual family income of under $20,000, while 36% identified as being from a household with an annual family income of between $20,001 and $45,000. Thirty-six percent of students in the sample identified as being from a household with an annual family income of between $45,001 and $100,000, and two students (18%) identified as being from a household with an annual family income of over $100,000.

Sixty-three percent of the Panther College sample identified as having attended public high schools, while 18% attended private high schools and two (18%) identified as being homeschooled. The mean high school grade point average was 3.154, with the lowest high school grade point average reported as a 2.0 and the highest as a 4.0. Each student in the Panther College sample completed the ACT college entrance exam, and the average ACT score was 24.181, with the 21 being the lowest reported score and 32 the highest. The mean college grade point average of the Panther College sample is 3.131, with the lowest being reported as a 2.0 and the highest as a 4.0.

Burgundy College Student Profiles

The mean age of the sample population at Burgundy College was 20.142 years, and 50% of the participants were male. Seventy percent of the participants identified themselves as Caucasian, 10% as African-American, and 20% as Hispanic. A total of 100% of the participants were full-time students, with three (21%) identifying as fourth-year seniors, six as third-year juniors (42%), two as second-year sophomores (14%), and two as first-year freshmen (21%). All students at Burgundy College follow the same curriculum and receive the same bachelor's degree in liberal arts.

One student from the Burgundy College sample population (7%) identified as being from a farm, while 14% identified as being from a rural community with a population of under 1,000 residents, one (7%) student identified as being from a small community (population between 1,000 and 4,000 residents), five students (35%) identified as being from a medium-sized community with a population of 4,001 – 10,000 residents, and two students (14%) identified their hometown as a large community with a population of between 10,0001 and 40,000 residents. Finally, 21% of the students in the Burgundy College sample identified their hometown as a large urban center with populations of over 500,000 residents.

Seven percent (1) of the Burgundy College sample identified as being from a household with an annual family income of under $20,000, while 28% identified as being from a household with an annual family income of between $20,001 and $45,000. Forty-nine percent of students in the sample identified as being from a household with an annual family income of between $45,001 and $100,000 and two students (14%) identified as being from a household with an annual family income of over $100,000.

Thirty-five percent of the Burgundy College sample identified as having attended public high schools, while 35% attended private high schools and 28% (4) identified as being homeschooled. The mean high school grade point average was 3.246, with the lowest high school grade point average reported as a 2.5 and the highest as a 3.8. Each student in the Burgundy College sample completed the ACT college entrance exam, and the mean ACT score was 25.642, with 21 being the lowest reported score and 33 the highest. The mean college grade point average of the Burgundy College sample is 3.422, with the lowest average reported as a 2.89 and the highest as a 3.75.

Conclusion

This chapter included a description of the methodology and recruiting process, as well as a rationale for the techniques, used in this dissertation. In addition, demographic information was presented, as well as the data analysis process was described. Chapter 4, which reports the findings produced from the analysis of data, follows.

Chapter 4: Results

Overview

Chapter 4 presents the findings and data analysis for the information gathered over the course of this project. The chapter provides a demographic comparison of the students at Panther College and Burgundy College and then breaks down the Ennis-Weir test scores between the two groups of students by total points, paragraph scores, and subscale scores. The researcher evaluated the quantitative data using the R Studio Suite of open source statistical analysis software. The researcher then evaluated the qualitative data found on each campus, including community and campus observations, classroom observations, the students' perceptions of their own critical thinking skills, differences between their high school and college experiences, and their overall college experience.

Student Demographic Comparison

The researcher conducted a series of Fisher's exact tests at the 0.05 (FET 0.05) level of significance on the demographic data provided by the students, excluding age and family income level, to determine whether any statistically significant differences exist between the two sample populations. The researcher conducted the Welch's *t*-test with a 0.05 level of significance on the students' age and family income level data, as the FET 0.05 is not an appropriate measure for quantitative variables. The Welch's *t*-test was chosen over the Student's *t*-test throughout this project because the variances of the two sample populations in this study are not equal, and the Welch's *t*-test was designed to negate any Behrens-Fisher problems, which are prevalent in Student t-tests when the variances of the two sample populations are not equal (Sawilowsky, 2002). As shown in Table 4.1, gender, race/ethnicity and class standing did not differ between the Panther

College and Burgundy College samples, which generated a *p*-value of 1.0 on the FET 0.05. The mean ages of the two sample populations differed only slightly (Panther College, 20.636 [*s*=1.629]; Burgundy College, 20.149 [*s*=1.099]), but with a *p*-value of .9776 as generated by the Welch's *t*-test, no statistically significant difference exists between the two groups. The family income levels of the two groups differed slightly as well, with a *p*-value of .9303 as generated by the Welch's *t*-test, but not to a level deemed statistically significant. The same is true for the differences between the students' hometowns, which generated a *p*-value of .641 on the FET 0.05. The greatest difference found between the sample populations was the type of high school the participants attended; however, with a generated *p*-value of .4504 FET 0.05, the differences still are not considered statistically significant.

Table 1: Student Demographic Comparison

	Panther College	Burgundy College	*p*-value
Mean Age			.9776
	20.6364 (1.629)	20.1429 (1.099)	
Gender			1.0
Males	6	7	
Females	5	7	
Family Income			.9303
> $20,000	1	2	
$20,000-$40,000	3	4	
$40,000-$100,000	5	6	
< $100,000	2	2	
Type of High School			.4504
Public	7	8	
Private	2	3	
Homeschooled	2	3	
Race/Ethnicity			1.0
Caucasian	7	9	
African-American	2	3	

Hispanic	2	2	
Class Standing			1.0
First year	2	3	
Second year	1	2	
Third year	5	6	
Fourth year +	3	3	
Hometown			.641
Farm	0	1	
Rural Community	2	2	
Small Community	0	1	
Med. Sized Comm.	2	5	
Large Community	1	2	
Small Urban Ctr.	2	0	
Med. Urban Ctr.	1	0	
Large Urban Ctr.	3	3	

Student Academic Profiles

The researcher conducted a series of one-tailed Welch's *t*-tests to determine whether statistically significant differences exist between the academic profiles of the two sample populations using a 0.05 level of significance, as shown in Table 4.2. The researcher found no difference between the mean college entrance exam scores of the two groups with a *p*-value of .329. There was also no statistically significant difference between the mean high school grade point averages of the two sample populations with a *p*-value of .703. Finally, there was no statistically significant difference between the mean current grade point averages of the two sample populations with a *p*-value of .148.

Table 2: Student Academic Profiles

	Panther College	Burgundy College	*p*-value
Mean ACT	24.181 (3.400)	25.642 (3.914)	.329
Mean High School GPA	3.154 (.577)	3.246 (.424)	.703
Mean Current GPA	3.131 (.577)	3.422 (.289)	.148

Ennis-Weir Test Scores

The Ennis-Weir Critical Thinking Essay Test was completed by the student participants at both Panther College and Burgundy College to test the researcher's hypothesis and null hypothesis:

> Hypothesis #1: Undergraduate students enrolled in a school focusing on liberal education will achieve higher test scores on a standardized critical thinking exam when compared to the test scores of students enrolled in a school that focuses on degree specialization.
>
> Null Hypothesis: No differences will exist between the scores on a standardized critical thinking exam between undergraduate students enrolled in a school focusing on liberal education when compared to the scores of students who are enrolled in a school that focuses on degree specialization.

Scores on the Ennis-Weir test can range from -9 to +29. As shown in Table 4.3, the mean score of the Panther College sample population was 20.545 (s=5.410), and the mean score for the Burgundy College sample population was 25.857 (s=1.231), which indicates an observable difference between the two mean scores of the two sample populations. A Welch's t-test was originally planted, but due to the sample populations' small size, any statistical analysis beyond the reported means and standard deviations is not appropriate.

Table 3: Ennis-Weir Test Scores

	Panther College	Burgundy College
Total Score Means	20.545 (5.410)	25.857 (1.231)

The researcher next compared the individual paragraph scores on the Ennis-Weir test to determine whether there is any difference between the performances of the two sample populations. Paragraphs 1 – 8 on the Ennis-Weir are scored on a scale of -1 to +3 and paragraph 9 on a scale of -1 to +5. Paragraph 9 potentially is worth five points because it asks the students to summarize the previous eight paragraphs. An Ennis-Weir test scoring sheet is included in Appendix E and explains the criteria for each numerical score. According to Ennis and Weir (1985), Paragraph 1 includes a misuse of analogy and, when combined with Paragraphs 2 and 5, creates a test subscale measuring the test-taker's ability to evaluate an argument. Furthermore, as noted by Watson and Glaser (2006), Paragraphs 1, 2, and 5 measure the student's ability to distinguish between strong and weak arguments. The Ennis-Weir test uses Paragraphs 3 and 8 to measure the participant's deduction skill, and those who identify Paragraphs 3 and 8 as sound arguments are to be assigned high scores (Ennis & Weir, 1985). Inference is measured by the participant's response to Paragraph 4, which lacks reason to support the given argument as written by the test's authors, and which is to be scored high if this limitation is recognized (Ennis & Weir, 1985). The ability to recognize an assumption is measured by the respondent's score on Paragraph 6, in which the author of the faux letter conducted poor sampling and lacked experimental controls (Ennis & Weir, 1985). Finally, according to Ennis and Weir (1985), the participant's penchant for interpretation is measured in Paragraph 7 and determined by the student's ability to recognize that the

author of the faux letter misused the word "safe" to bolster his argument. Mean scores for the individual paragraphs on the Ennis-Weir test, with standard deviations in parentheses, can be found in Table 4.4, along with the mean scores for the Ennis-Weir test subscale measurements, also with standard deviations in parentheses, in Table 4.5.

Although this project originally called for a series of *t*-tests to analyze the individual paragraph scores, after consulting with various statisticians because of the small sample populations that were produced, the researcher decided to run a series of chi-square tests for independence using a 0.05 level of significance to determine whether the individual paragraph scores on the Ennis-Weir test either accepted or rejected the aforementioned null hypothesis. The individual paragraph scores show that the null hypothesis should not be rejected and that the scores are not dependent on which institution was attended.

Table 4: Individual Paragraph Scores

	Panther College	Burgundy College	*p*-value
Paragraph 1	2.09 (1.221)	2.85 (0.363)	.999
Paragraph 2	2.09 (1.136)	2.85 (0.363)	.970
Paragraph 3	1.90 (0.943)	2.64 (0.497)	.931
Paragraph 4	2.00 (1.000)	2.71 (0.468)	.903
Paragraph 5	2.27 (0.786)	2.71 (0.468)	.942
Paragraph 6	2.18 (0.981)	2.64 (0.633)	.963
Paragraph 7	2.45 (0.820)	2.71 (0.468)	.972
Paragraph 8	2.09 (0.539)	2.35 (0.497)	.941
Paragraph 9	3.45 (0.820)	4.07 (0.997)	.901

The researcher conducted further chi square tests of independence with a 0.05 level of significance on the Ennis-Weir test subscale scores as described previously to test the aforementioned null hypothesis. As shown in Table 4.5, we cannot reject the null hypothesis and cannot assume that the subscale scores are dependent on the institution attended.

Table 5: Ennis-Weir Test Subscale Scores

	Panther College	Burgundy College	*p*-value
Evaluation of Argument	2.41 (0.649)	2.80 (0.401)	.941
Deduction	2.20 (0.588)	2.50 (0.510)	.984
Inference	2.16 (0.937)	2.71 (0.468)	.912
Assumption Recognition	2.25 (0.965)	2.64 (0.633)	.991
Interpretation	2.41 (0.792)	2.71 (0.468)	.965

In addition to the Ennis-Weir test, the researcher compiled qualitative data found on each campus, including community and campus observations, information regarding why the participants chose their respective post-secondary institutions, classroom observations, students' perceptions of their own critical thinking skills, differences between their high school and college experiences, and their overall college experience in order to answer the following two research questions:

> Research Question #1: Are there differences in how students think about critical thinking between students who attend a school focusing on liberal education versus those students who attend a school that focuses on degree specialization?

Research Question #2: Are there important differences in the personal and/or academic characteristics of students who attend a school that focuses on liberal education versus those students who attend a school that focuses on degree specialization that can explain any disparity in the critical thinking ability of the two populations?

Panther College Community Observations

Panther College is located in a small Midwestern city (population 7,284) that was founded in 1815 and is situated about an hour from a large urban center. The city's downtown includes a town square with a red brick county courthouse in the middle surrounded on four sides by smaller brick buildings containing a variety of retail spaces. The city is surrounded by corn, bean, and wheat fields. The college sits a mile from a major interstate highway extending from the nearby large urban center. The city boasts a large selection of both local and national chain businesses. The city was a pivotal site on the Underground Railroad as a hiding place for slaves recently freed from Missouri, as well as the site of the Lincoln-Douglas Debates in 1858. There are plans to build a farm museum in the city; however, at the time of the researcher's visit, the steering committee, which was first formed in 2006, was still short on funding.

According to a local gentleman encountered in a town square coffee shop early one morning, "Only the best of the best are at (Panther) College… good Christian kids who never make it into the paper for misdeeds." This sentiment was also found at the local Subway restaurant, the MotoMart gas station and a small art gallery and gift store inside of a coffee shop on the town square. The students are not unknown to the local residents as many of them work in the local businesses, as pointed out by the barista in the coffee

shop who named Panther College students who work at many of the businesses on the square. The community seems to enjoy a good relationship with the students, faculty, and staff at Panther College, and the college and community seem to feed off one another to help ensure each other's future prosperity.

Panther College Campus Observations

Panther College is not unlike many small colleges in the Midwest. The campus occupies about 18 square blocks in the middle of the city and is comprised mainly of red brick buildings and at least two campus quadrangles. Many of the students on campus were listening to music on personal electronic devices using headphones, and many seemed to be socially isolated in their own environment, as it was rare for them to make eye contact with or greet the researcher as he walked through campus. When the researcher greeted many of the students, most would respond by quickly turning their attention to their personal electronic devices, or the sidewalk beneath their feet, in order to remain seemingly safe in their own worlds. This was true when the researcher walked into the college library and college art gallery, both of which were staffed by students at the front desk, all of whom were too engrossed in their own activities to greet the stranger at the door. There was evidence of no dress code on campus, as the attire worn by the students ranged from business wear to jeans and athletic wear to pajamas.

The staff and administration of Panther College were happy to have the researcher on campus and provided him with any support he needed. After a short meeting with the vice president of academics on campus, the researcher was escorted to the first classroom he was to visit by a member of the vice president's staff. The female staff member had worked at Panther College for 34 years and claimed that most of the staff on campus

were "old timers" with decades of service. "I'm not sure what they will do with this place once we start retiring," she said with a smirk on her face. When the researcher asked the staff member whether she would take a job off campus for a $100,000 yearly salary, she kindly said, "I would have to decline," followed by "Well, I don't know, that's a lot of money, but I'd probably just stay here."

The academic buildings on the Panther College campus were not unlike the academic buildings at most Midwestern colleges and universities. The classrooms were dispersed throughout the buildings and mixed with faculty and other academic offices. The bulletin boards in the buildings were plastered with flyers advertising the campus study abroad program, as well as the college's prison initiative, Habitat for Humanity and religious and spiritual opportunities on campus. Intramural sports also were advertised, along with the various academic organizations, choirs, and bands. There seemed to be an almost endless number of activities and organizations for the students to take part in just based on the flyers hanging around campus.

Why Panther College?

The students who participated in this project at Panther College decided to attend the college for a variety of reasons. Three of the students cited intercollegiate athletics; one was recruited to play basketball, and two were recruited to play football. The basketball player, as well as six other students who completed the questionnaire, mentioned that they chose Panther College because it is a Christian college. A third-year female student who took part in an interview said:

> I actually really wanted to be in a Christian environment and this place has that. We had to agree to a lifestyle statement when we got

> here and many people wouldn't do that. It's a commitment to God, the college and my fellow students that says I will treat them with respect at all times. I don't think students at other big colleges and universities would do that. It's something that you only get at a small Christian college, like (Panther) College or St. Louis Christian College. I had to decide between those two colleges and I think either one would have been good. This place had my friends though.

Although many of the students at Panther College were majoring in something other than ministry, many were working toward a minor in ministry, which they hoped to use in a non-pastoral role within a Christian community. This plan was revealed both on the questionnaire and during interviews, one of which was with a first-year male student:

> I am majoring in psychology but I really want to spend some time as a missionary in another country before I return home to serve a church as a youth minister. The great thing about (Panther) College is that we are all required to take religion courses so it's pretty easy to get a minor in ministry and you can use that to get a job. There are also Church Plant Coordinators with the Vineyard who come here to recruit and I may do that. Lots of students end up planting new churches from here. I know three people who are graduating this year with different majors who are planting churches all around the country.

The goal of planting a new church upon graduation was not simply the idea of this student as many of the male students mentioned such and many of the female students mentioned that their significant others were planning to establish churches. None of the female participants mentioned the desire to establish a church themselves upon graduation.

Panther College Classroom Observations

The researcher used a rubric (Appendix F) to conduct a series of low-inference classroom observations at both Panther College and Burgundy college in order to ensure that there was a difference in instructional methods. The researcher observed 11 classes over the course of three days at Panther College and 12 classes over the course of four days at Burgundy College. The researcher arrived at each classroom before class began and asked the instructor for permission to introduce his study, recruit students and then to remain in the classroom to conduct a low-inference observation of the class. The following are descriptions of the observations and attempted observation at Panther College in chronological order.

Wednesday 8:30 – 9:20 a.m.: Classroom Observation #1: The researcher first visited a 100-level Christian thought course that was attended by 12 students sitting in rows. The instructor asked a student to begin class with a prayer, after which the instructor took attendance. At 8:38 a.m. the instructor started her lecture, beginning with a recap of the previous class session. She spoke to the students for a total of 23 minutes before inviting them to interact with an agree/disagree question. The students did not accept the invitation for interaction, so the instructor answered the question herself before continuing the lecture, which included PowerPoints and stories from her own faith

journey. The instructor did not reference the textbook, titled *Foundations of Christian Thought* by Mark Cosgrove, at any point during the class. Another six minutes passed before the instructor asked the class another question. A student provided a short, one-sentence answer, and the instructor continued to lecture until 9:18 a.m., when she stopped to make a few announcements regarding homework and projects. She dismissed her students at 9:19 a.m. and made her way out of the classroom after asking whether the researcher had learned anything.

Wednesday 10:30-11:20 a.m.: Classroom Observation #2: The instructor and four students were already in the classroom by the time the researcher arrived at 10:23 a.m. to observe a 300-level course titled *Pauline Epistles*. The researcher introduced himself to the instructor and asked for permission to address his class and then to conduct a low-inference observation. The instructor asked the researcher to explain this project and the term "low-inference observation," and then asked whether the researcher had permission to be on campus. The researcher explained the project and the observation technique and then told the researcher that he was on campus with the permission of the vice president of academics. The instructor was silent for a minute as he rustled through homework assignments and then told the researcher that his "time would be better spent in another classroom." The researcher thanked the instructor for his time and left the classroom.

Wednesday 10:30-11:20 a.m.: Classroom Observation #3: The hour was not lost as the researcher was able to find another instructor with a 10:30 a.m. class and asked permission to introduce this project and conduct a low-inference observation. Observation #3 occurred in a 300-level education class. The female instructor was

pleased to have the researcher in her class and asked questions from the time the researcher introduced himself at 10:27 a.m. until she started to take attendance at 10:34 a.m. She then turned the floor over to the researcher, who spent approximately four minutes introducing the study and recruiting volunteers. One student asked what kind of pizza was going to be served that night and made the decision to participate based on the choice of pizza shops.

The instructor lectured using PowerPoint from about 10:40 a.m. until 11:06 a.m., when she had the 24 students in the classroom gather in groups of four. The students were given a scenario in which a third-grade student was making paper airplanes in class. The instructor gave her students "about five minutes" to produce an appropriate behavior modification plan for the third-grade student. The groups were encouraged to use their textbook, titled *Managing Classroom Behaviors* by James Kauffman, for this activity. Work ceased at 11:16 a.m., at which point each group had to present their behavior modification plan. The instructor asked questions about the plans, and each group answered those questions. The instructor asked the students from the groups not presenting whether they had any questions about the behavior modifications offered by the presenting group; however, these attempts were unable to elicit interaction between the student groups. Class was dismissed at 11:24 a.m. after the instructor told the students that they would start Friday's period with the behavior modification plans they had just designed.

Wednesday 11:30 a.m.-12:20 p.m.: Classroom Observation #4: The researcher was able to observe a 200-level Old Testament survey course. The instructor allowed the researcher to speak, and then class began with a prayer at 11:36 a.m. The instructor was

dynamic as he was able to use his highly-polished knowledge of biblical history in the class, including frequent transitions from English to Hebrew to classical Greek, all of which seemed to keep the students' attention. The instructor often referenced the textbook titled *Old Testament Survey* by William Sanford LaSor. However, aside from having three students read short passages from the textbook, there was no other interaction with the students. The instructor would ask questions and immediately answer the questions himself without giving the students a chance to respond.

Wednesday 1:30-2:30 p.m.: Classroom Observation #5: The researcher next observed a 100-level speech communication course that is part of Panther College's core curriculum. Two students gave their end-of-semester speech, which was to be no more than 15 minutes in length and which the speaker's fellow students would rate on a scoring rubric provided by the instructor. The first speech was about the student's experience volunteering at a homeless shelter over spring break, and the second was about the life of a "preacher's kid." Both speeches were complete in 36 minutes and class was dismissed at 2:08 p.m. The instructor did not offer any comments to the speakers beyond "good" and "could be a little longer." The 16 students in attendance turned the grading rubrics over to the speakers and class was dismissed.

Wednesday 3:30-6:20 p.m.: Classroom Observation #6: The researcher next observed a 400-level psychology seminar populated by 11 seniors and one junior. The students sat in a circle with the instructor sitting amongst them. The instructor spoke to the researcher at length about this project and let the researcher start the class at 3:36 by introducing his project. The students in the classroom had many questions about the project, namely about the curriculum offered at a Great Books school and what students

who graduate from a Great Books school "do" after college. The instructor took over at 3:42 by giving the students a two-question quiz over the assigned readings. Once the quizzes were collected, the instructor let the students answer the quiz questions in class, which turned into a discussion about the textbook readings on cognitive testing. The textbook used in the course was titled *Descriptive Psychopathology* by Michael Alan Taylor. The instructor spoke very infrequently, primarily to simply guide the conversation when need be and to offer an occasional expert opinion or story from her time as a prison psychologist. The class was dismissed at 6:03 p.m. The instructor apologized to the researcher for not having a longer class and explained that she usually dismisses her students once they have exhausted the subject and covered the main points.

Thursday 8:00-9:20 a.m.: Classroom Observation #7: The researcher started the day at Panther College with a high-energy female instructor who was teaching a 200-level marketing course. The instructor opened the class session with a brief two-minute video clip of the ABC television reality show Shark Tank. In the video clip, a panel of millionaires was presented with a product, in this case a t-shirt that reveals a hidden message when the shirt is drenched with a liquid, and was in turn asked for a venture capital investment of several thousands of dollars. The instructor then broke the 30 students into five groups, giving them 30 minutes to design a marketing strategy for the product. The instructor moved between the five groups and constantly interacted with the students.

After each student group provided the class with their marketing strategy, each of the other groups was asked for their opinions, some of which were very critical when one group broke away from the marketing strategy presented in the text titled *Marketing*

by Roger Kerin. The instructor stepped in on several occasions when the students questioned the merit of such a product in order to keep them focused on the marketing strategy. The class concluded after the students came together as one classroom and pulled from each other to come up with a marketing strategy that they thought would be successful. The course ran until 9:26, six minutes past its scheduled dismissal time.

Thursday 9:30-10:50 a.m.: Classroom Observation #8: This observation occurred in a 200-level history class with 20 students. The researcher finished introducing his study at 9:32, a student offered an opening prayer, and the instructor lectured using PowerPoint from 9:33 until he asked for "any questions" at 10:42. No questions were asked, and class was dismissed after the instructor gave the students a reading assignment from Howard Zinn's *A People's History of the United States*, which was not referenced during this particular class session.

Thursday 11-12:20 p.m.: Classroom Observation #9: The next observation took place in a 200-level management course with 18 students in attendance. The instructor began class at 11:08 a.m. after allowing the researcher to introduce this project and recruit students. The instructor asked the students about the readings, and two students volunteered to speak about financing business operations, answering a total of three short-answer questions from the instructor. The students were reading *Corporate Finance* by Stephen A. Ross, a small text that the class had used for the first time and that was serving as a supplement to their main text, *Principles of Management* by Tony Morden. The instructor then turned his attention to the PowerPoint he had prepared and lectured from 11:11 until 12:14 a.m., when he dismissed the students.

Thursday 2-3:20 p.m.: Classroom Observation #10: A 400-level American Literature course served as the next observation classroom. The class started with a group prayer before the students opened their individual copies of the *Norton Anthology of American Literature* and began discussing Flannery O'Connor's 1955 short story "The River." The students questioned at length why the story's main character, a boy named Harry, lied about his name and stole a Bible from his babysitter. The Ten Commandments were a frequent topic in the class, as were "little white lies" during childhood; however, the students seemingly missed O'Connor's commonly infused Christian concepts of grace, pride, sin and eventual redemption, although the instructor worked hard to get the students to recognize these underlying themes amongst the visceral acts of lying and theft. The class was dismissed at 3:11 p.m. after the instructor assigned another short story for the following class session.

Friday 9:30-10:20 a.m.: Classroom Observation #11: The final classroom observation at Panther College occurred in a 400-level criminal justice career seminar course. The instructor warned the researcher that he "(does) not do a whole lot of teaching in this class," as he allows the students to present on the day's topic and run the class discussion that follows. The student who presented during this particular class session discussed the history, function and hiring standards of the Federal Reserve Police. The student read the information off of his laptop screen from the Federal Reserve Police website. One student asked the presenter whether "these guys [are] the police or just guards?" The presenter did not have an answer. The instructor told the class that Federal Reserve officers are federal agents like the FBI, and he looked to the researcher for approval. The researcher, who is a criminal justice instructor himself, explained that the

Federal Reserve Police are neither security guards nor federal agents, but police officers protecting a private entity (the bank) and members of a federal agency (the board). Shortly after the researcher provided a brief explanation of the Federal Reserve's structure, the class was dismissed at 10:01 a.m. This was the only break from protocol, as the researcher did not participate in any other classroom discussions during the course of this project.

Panther College Students' Perception of Their Own Critical Thinking Skills

As shown in Table 4.6, the students who participated in this project at Panther College gave themselves high marks in terms of their critical thinking ability and rated the Ennis-Weir test as fairly simple, which is shown as a mean score with the standard deviation in parentheses. The students were asked to rate their critical thinking ability on a Likert scale with a range of 1 – 10, with 1 being poor and 10 excellent. The students also were asked to rate the difficulty of the Ennis-Weir test on a 1-10 Likert scale, with 1 being simple and 10 very difficult.

Table 6: Panther College Student Perceptions

	Critical Thinking Ability	Ennis-Weir Test Difficulty
Panther College Mean	7.909 (1.758)	2.363 (1.206)

The Panther College students were not quick to give the credit for their critical thinking ability to the college when answering item number 10 (How do you think your undergraduate education has impacted your critical thinking ability?) on the questionnaire. One student commented that the college had only helped "somewhat," while another answered "not much," and yet another, who identified himself as a second-year student, responded that he had "not gotten to those classes yet." One senior student

credited the college and its Christian atmosphere as being the impetus for the development of his critical thinking skills, which he rated as excellent (10). "Before college I took most things for face-value, but now at a Christian college, where I don't agree w/ everything, I have to think critically and argue with those who buy into the stuff they teach here."

The students who took part in interviews with the researcher spoke about their critical thinking skills in a way that seemed disconnected from the definition of critical thinking that most students provided on the questionnaire. Most students used phrases such as "problem solving through different viewpoints," "the ability to reason," "argumentation," and "thinking outside the box" to define critical thinking on the questionnaire. However, when asked during the interview how their undergraduate experience had impacted their critical thinking skills, one student told the researcher that he had learned a lot of material and facts to teach students when he begins his career as a high school history teacher, while another mentioned that he had over 1,000 Bible verses memorized and claimed that such rote memorization will make him a good pastor after college.

The researcher asked the student with the memorized Bible verses to recite his favorite verse; he offered Matthew 10:16, which reads, "Behold, I send you forth as sheep in the midst of wolves: therefore, be wise as serpents, and harmless as doves." The researcher asked the student what the verse meant to him, and he answered, "Well, it means Jesus, who is the Son of God in the trinity, of course, is sending us out as sheep in the midst of wolves and he is telling us to be wise as serpents and harmless as doves." The researcher asked the student how the passage applied to those people today who live

in large metropolitan areas where there are perhaps no sheep, wolves, serpents, or doves. The student simply replied, "Well, it still does apply because it's the word of God even if you haven't seen any of those things." The researcher asked the student to put in his own words the meaning of the passage, and the student replied, "It says what it says and I am not one to put words into God's mouth. I mean, I think everybody knows what it means." The researcher moved away from the topic after sensing a great amount of frustration from the student.

One Panther College student who was interviewed offered his take on academics and learning when asked to identify any aspects of the curriculum that had helped improve his critical thinking ability:

> I don't like classes where we have to read. I like it better when the professor tells us what we need to know and we can take notes or not take notes and then we get a Scantron test. I do a lot better in that kind of class because they challenge my thinking ability because I have to remember all sorts of stuff. When I get into a class when (sic) I need to write essays and stuff I don't do as well because I don't know what the professor wants to know, but I know what he wants to know when I have a choice of answers. I'd just rather have the professor tell us what he wants to know when we take a test.

Another student, responding to questionnaire item #27 (How has your college education thus far prepared you to complete the Ennis-Weir Critical Thinking Essay Test?), wrote "None that I can think of." Just as her colleague who participated in the aforementioned interview, she, too, preferred multiple choice tests because she "simply does better."

Panther College Students' College versus High School Academic Experiences

Evidence exists of change between the Panther College students' academic experiences in high school and college. The students were asked a series of questions pertaining to their study habits and test preparation techniques in high school and college, as well as time spent on social activities. The students also were asked about the average number of hours they studied outside of class in both high school and college. As shown in Table 4.7, there is an observable difference between the mean number of hours the students spent studying outside of class in high school versus college with standard deviations for the mean number of hours are shown in parenthesis.

Table 7: Panther College Students' Time Devoted to Studying Outside of Class

	High School	College
Weekly Study Hours:	9.727 (4.58)	4.454 (2.423)

When the Panther College students were asked to explain any changes in the number of hours they studied outside of class between high school and college, they pointed namely to an array of social activities offered by the college. Many of the students listed the organizations in which they were involved, such as student government, the college radio station, choirs, bands, intramural sports, intercollegiate athletics, religious activities, and residential life programs. A second-year male Panther College student summed it up as follows:

> There is so much stuff to do here. In high school, I had more time to read and study and stuff, but now that I am in college, I have so many things going on that I barely have time to do class stuff. I am the captain of a Wiffle Ball team on campus so I have to schedule

> games and practices and stuff. I am also a representative for the residence hall board and I have to make time for my girlfriend too. I mean, I used to study quite a bit in high school even with all of the sports and extra stuff I did, but my parents always kept a limit on that stuff, but they (the college) keep us pretty busy here with extra stuff.

A sixth-year female student told the interviewer that it was difficult to determine what was more important, studying or academics, and that was the reason she was still an undergraduate student after six years:

> I was always told that jobs want to see a long list of extracurricular activities on your resume. I didn't put too much into my classes during my first two years because I was so busy trying to build my resume and I ended up dropping classes and taking the wrong classes and only going to easy classes and pretty much just doing whatever I wanted and now I am here six years later still working on a degree… but I have a lot of extracurriculars on my resume. (Panther) College really pushes you to do a lot of extracurriculars so it's almost like they are more important than class.

A third-year student who participated in an interview made an important distinction between college and high school, citing more controls placed on his extracurricular schedule before college:

> It's tough here because there are all kinds of things to do and your friends who are in different groups, like flag football and basketball, they both want you to be on their teams. I just say yes and hope I can study later. Or when we are playing music or kayaking. I just say yes and hope I can study later. In high school, my mom would keep track of my studies and make sure my homework is done, but we don't have that here, so I just do what I want and hope for the best in my classes.

Another student claimed that the time he spent studying between high school and college had increased from 12 hours per week to 20 hours per week. However, this student had a lot of intrinsic motivation to increase the time he devoted to his studies:

> I was in the army and did a tour in Iraq. I know they say that college is free when you're in the Army but I had to go to Iraq. I worked hard for this free education and I know what I gave up for it so I am not going to waste that. I'm going to do my best here and take it seriously so I make something of this opportunity.

Another Panther College student also recognized the cost of education and included in his survey that he devotes more hours to studying in college than he did in high school because he "see(s) how much college costs, and it would be a waste of money not to try harder."

Item #18 on the questionnaire asked the students whether any difference existed in the amount of time they spent on social activities between high school and college and

asked them to explain the differences if so. None of the Panther College students who participated in the study indicated a decrease in the time spent on social activities. One student wrote that he spent five to seven hours per day on social activities at Panther College. Another student answering the survey item admitted that socialization had hurt her academically. "Oh yes! I was painfully shy in h.s. and spent all of my time on homework. Now I love people and socializing even though I know the extent of it has hurt me academically." Another Panther College student who participated in an interview explained the differences between socializing in high school and socializing in college:

> You have your parents in high school that are controlling everything you do and everybody you hang out with and you don't have that here. I can go out with my friends and go to the Burger King drive thru at midnight or 2am if I want and nobody is going to say anything. Plus, we are all in the same boat here with classes and stuff that we all seem the same. This is a small college also so we see each other all the time in class, at lunch and dinner and at events and other stuff. High school had a lot of groups, cliques I think you called them, but there are no cliques here. I have a core group of friends that I chill with about 10 hours a day but I can go chill with other groups on campus too. It doesn't matter.

Yet another student who was interviewed mentioned that college was a sort of rebirth for her from her time in high school:

> High school didn't go too good for me. I guess I wasn't very popular because of a lot of things but in college no one knew me so I can be anything I wanted to be and like actually everyone liked me when we moved in and went through like orientation the first day. I am out with my friends in college more now than I ever was in high school because the past don't matter here and everything is new.

Overall, the participants at Panther College had noticed little to no change in the way they prepare for class on a daily basis between high school and college. Items #11 and #12 on the questionnaire asked the students how they generally prepare for class on a daily basis and how the way they prepare in college differs from the way they prepared in high school. One student wrote, "I actually don't" and "no different." Another student wrote, "I just go to class," while another wrote that he spends his time before class, "Psyching myself up to actually go to class. It's kind of useless to go to class because the profs just read from the book and I actually already have the book." Yet another student explained how she packs her backpack with her laptop, iPod and a pen. This was no different than how she prepared for her classes when she was in high school.

When the researcher asked the students about studying in preparation for an exam, most students spoke of a reliance on study guides given by the professors, and of "memorizing" the study guides and the PowerPoint presentations that the professors posted on the school's online learning platform. One student mentioned her disappointment upon learning that an adjunct instructor who she felt prepared them well for exams was moving on to another school:

> Mrs. (Brown) used to give us the test without answers on them on the day before the test and we could just use that to study. She didn't let us bring them to the test but I would just find the answers and then memorize them for the test and then take the test and get a really good grade. She was a really good teacher because we all got A's on the tests and A's in the class. We were actually all pretty mad when they didn't just hire her here but she just finished her PhD and got hired by a place in Ohio or Idaho. We were mad because she really helped us learn the stuff, but her new students are pretty lucky.

Another student wrote of a professor that any Panther College student would want to avoid, and, in his position as a resident assistant on campus, he explained that he makes it his duty to warn the younger students:

> I usually tell the freshmen that they do not want to take Mr. (Blue) or Dr. (Green) because they don't ever actually use bubble sheets for their tests. You can take the same class with Mr. (Yellow) and he makes it easy on you. I just think we all prefer tests with bubble sheets instead of harder tests. We can usually spend a few minutes before class looking at my notes and pass a bubble sheet test.

Panther College Students' Overall College Academic Experience

The students at Panther College found it difficult to relate their undergraduate education to any future endeavors. When asked how the instruction they had received at

Panther College could be used in "real life situations," one third-year business student wrote that it could "be implemented but it's not really all that useful." Another third-year student wrote that he "feel(s) like only one or two of my classes will be useful." A second-year student who took part in an interview with the researcher said:

> Not sure. I suppose I've learned a lot of information but I'm not sure what I will do with it all. I think I make more rational decisions now but that is because I have been working with a counselor on campus. I guess I can use that in real life situations. I just don't know what all of these classes are doing for me. Maybe I will know when I am a senior or when I graduate.

The level of satisfaction amongst Panther College students seemed to wane, especially amongst the third- and fourth-year students, one of whom wrote, "I don't think (Panther) College prepared me much at all for the real world… and it's only 3 weeks away." A fourth-year student wrote that she was on the fence about her Panther College experience because she really liked the classes, but she really did not like the way some of the teachers taught. A fourth-year student who was interviewed and asked about his satisfaction with the overall undergraduate experience responded:

> No, I'm not satisfied, I think I could have learned a lot more, but it's alright because I'm leaving with a little piece of paper that will open some doors. You never actually see any jobs advertised anymore that don't want a college degree so it will all work out and it will all be alright. I just wish someone would have told me that getting an English degree was not a good idea. I heard all the time that I could

> do anything with an English degree and that companies are always looking for them, but I am finding that that is actually not true.

Only one student, a sixth-year female who agreed to an interview, expressed absolute satisfaction with her Panther College undergraduate experience:

> I loved it here. I was able to study in Spain and Germany. I met my husband here. I have so many friends from here and I think I am just so much closer to God and the Christian idea (sic) because I am here. I actually met so many friends here. I wouldn't take it back for anything, not even Harvard or Yale or $1 million, that's how much I loved my time here.

Burgundy College Community Observations

The researcher flew into the small New England airport nearest to Burgundy College a full day before the research project was to begin in order to learn about the college from the residents of the college's host city, known as WNE for this project. Maple and ash trees dominated the landscape around WNE. Many of the maple trees had been tapped for maple syrup, so the woods were filled with the spider web-like blue tubes that transport the syrup to the 110 gallon tanks that serve as repositories.

WNE, with a population of 2,833 as denoted on the sign welcoming visitors to the community, was first settled in 1735 to defend what was then Massachusetts from New France. Like many New England towns, the Town of WNE includes a central settlement surrounded by many villages, all of which fall under the control of a single local governmental body. WNE seemed to be inhabited by many small farmers and local

artists and artisans, and as pointed out by the manager of a local art gallery, it is the home of the only 100% fair trade store in the state. There is an Indian art museum, as well as many covered bridges spanning crystal clear rivers and streams, but no nearby big-box megastores. The grocery and hardware store, pharmacy, pizza shops and restaurants, with the exclusion of the Subway sandwich shop, are all locally owned and operated, non-franchised businesses.

Those living in WNE seemed rather indifferent towards the students at Burgundy College but were well aware of the happenings on campus. The first person who the researcher approached and asked about Burgundy College, a gentleman of retirement age conducting business at the local post office, said the college has great Lenten fish fries, and although he had never attended one himself, his next door neighbors rave about the Pollack the college serves. The pharmacist, whose shop sits across Main Street from the post office, admitted that he, too, had never visited campus, nor did he know any Burgundy College students, but his wife, the pharmacy tech, told me that one student visits the shop once a month for an allergy prescription. "He seems like a really nice kid," she added. Similar stories of little to no contact with Burgundy College students, and little to no contact with the college itself, were shared with the researcher throughout WNE.

Although many of the residents of WNE had never stepped foot on campus or met any Burgundy College students, a few were quick to point out that the school is not very welcoming. "It's like a cult up there," said the middle-aged female cashier at the grocery. "I don't think they like people to go up there," she added. A female customer in the same grocery line as the researcher entered the discussion and called those at the college

"hardcore Catholics," lamenting about how their beliefs are not in line with those of contemporary society.

"I don't know how they get kids to go there. My girls won't be going there. They (her daughters) need a place that's more fun without the weird God stuff," was the first comment the researcher heard about Burgundy College in the local hardware store. The employee who offered the comment recruited another store employee to join the conversation. That employee told me that she had heard that it was "weird" on campus, but she did not know anybody who had attended the school and had never visited campus herself. "Yeah, I think it's gated off and you can't go up there," finished the first employee. Although the common sentiment throughout WNE was that the college was closed off and perhaps unfriendly to the locals, a sign on the corner of Main Street and the road leading to the college invited the public to the rave-worthy Friday fish fry.

Burgundy College Campus Observations

The college itself is tucked away in the same maple and ash woods that engulf WNE. The first distinguishable buildings on campus are the academic buildings, which consist of three classrooms each with large tables surrounded by chairs, an arrangement that lends itself to Socratic dialogue. Upon pulling into the ungated entrance, the administration building came into view, as well as the red brick chapel that seemed out of place amidst the modular constructed campus linked by gravel paths. There remained a few of the stone walls that were remnants of the former 19th-century farms that existed on the property before the college. Overall, the campus, with the exception of the red brick chapel, had a temporary feeling, as if it were not a place of higher learning.

Many colleges, such as Panther College, exude the feeling of academic rigor through their strong brick buildings, wide concrete sidewalks and perfectly manicured lawns. Although that was not that case at Burgundy College, the students clad in their jackets and ties or skirts and blouses embodied that same feeling. Students at Burgundy College are required to wear "formal dress" while attending class.

The first discussion that the researcher overheard just inside the front door of the administration building was about Nicomachean Ethics. The conversation dissolved as the six students quickly greeted and welcomed the researcher. The students, whose group quickly doubled in size, were inquisitive as names, hometowns, and the researcher's business with the college were shared. The students had learned of this research project though campus email and were eager to participate. After a brief discussion with the college's academic dean, the researcher walked down the muddy path to Classroom #3 to sit in and conduct low-inference observation on an 8 a.m. American Constitution class.

The researchers felt a sense of mutual respect at Burgundy College. The students were not slaves to their electronic devices and were, for the most part, in the habit of greeting those along their paths. Although the students had secure, private rooms within the residence halls, many of the students left their books, class materials, and other personal belongings on bookshelves in unsecured common areas of the administration building. The researcher asked many students whether they were worried about the security of their personal property, and aside from one story of a theft that turned out to be a mistake, the students seemed comfortable leaving anything, even laptops and other electronic devices, in the common area.

The researcher joined a table of sophomores and juniors for lunch on the first day. The entire community is invited to meet for meals, and each meal opens with a community prayer led by a student. Announcements are also made during the meals. The discussion at the breakfast and lunch tables almost always included a discussion of course material. At lunch on the first day, the sophomores were discussing Heraclitus' theory of *logos*, and as they recapped the class they had just completed that morning, the juniors reflected on the same class they had had a year earlier and challenged the sophomores on their interpretations of Heraclitus' work. The conversation fluctuated between social aspects of the students' lives and academics, a pattern prevalent at all three meals that the researcher shared with the Burgundy College students.

Although the students often spoke about academics throughout the day, they appeared to have a well-balanced college experience. Many students play intramural sports, which occasionally turn into intercollegiate sports when the soccer and football teams play against other Great Books schools in New England. The researcher spotted advertisements on the campus bulletin boards for student government, drama club, the outdoors club, the fishing club and the prolife club, as well as flyers for several choirs and musical ensembles on campus. The art club had an upcoming show scheduled, and the prolife club had an upcoming Rosary planned at a nearby abortion clinic.

Why Burgundy College?

The students at Burgundy College cited many reasons for choosing to attend the school; however, they overwhelmingly cited the school's Christian identity and the use of Socratic dialogue in the classroom as the impetus for their final decisions. Twelve of the 14 students who answered item #7 on the questionnaire, which asked why they chose

their particular undergraduate institution, cited the school's Christian tradition, while 13 of the 14 mentioned the Great Books curriculum and 10 of 14 mentioned the development of critical thinking skills. A female junior at Burgundy College summed up the feelings of the majority of her colleagues who took part in this project when she wrote:

> I chose (Burgundy College) because I wanted to maintain a closeness to the sacraments of the Church and because of their method of teaching the Great Books with the Socratic Method. I think learning how to think is more important and a better use of time and money than learning what to think.

In addition, one student mentioned choosing Burgundy College because she was a legacy student, and two mentioned that they wanted to join their friends who were at the school or planning to attend the school. Over half of the male respondents (4) cited their desire to prepare for entering a Catholic seminary with the intent of becoming Catholic priests upon graduation.

Burgundy College Classroom Observations

Just as at Panther College, the researcher also conducted a series of low-inference classroom observations at Burgundy College to ensure that differences did indeed exist between the instructional methods used at the two schools. The researcher observed 12 classes over the course of four days at Burgundy College. The researcher arrived at each classroom before class began and asked the instructor for permission to introduce his study, recruit students, and remain for the duration of the class to conduct a low-inference

observation. The following are the observations made in each classroom in chronological order.

Tuesday 8 a.m. – 9:20 a.m.: Classroom Observation #1: The researcher first observed a junior-level American Constitution course. Two students already occupied the classroom by the time the researcher arrived. When the others arrived, the three male students, dressed in formal wear, immediately began discussing the readings for the day. The class was opened with prayer. The instructor spoke for under one minute before turning the class over to the student who was assigned to discuss the day's topic. The student leader spoke for just under four minutes before the instructor interjected with a question. The students referred to each other as Mr./Ms. followed by the student's surname throughout the discussion. That initial question was answered by a student who referenced a quotation from Thomas Jefferson. Other students engaged in dialogue, and aside from one clarification of a term, one text citation, and two questions to help fuel the students' discussion, the instructor did not speak again until 9:14 a.m., when he wrapped up the class and closed with prayer.

Tuesday 9:30 – 10:50 a.m.: Classroom Observation #2: The second classroom observation at Burgundy College took place in a sophomore-level Greek and Roman epic poetry course. The students had just finished reading the *Iliad* during the previous week. The class opened with prayer, and in the same manner as the first classroom observation, the instructor spoke only briefly before turning over the discussion to a student. The student discussed the themes within the *Iliad* of Nostros (homecoming) and Kleos (glory earned in heroic battle) and how King Agamemnon had to choose between the two. The instructor interrupted the discussion only rarely, once to encourage one student to keep

trying to express his train of thought, and twice to provide some historical context for the students when asked. Again, the students referred to each other as Mr./Ms. followed by the student's surname during the discussion. The instructor concluded the class at 10:49 a.m. with prayer.

Tuesday 1 - 2:20 p.m.: Classroom Observation #3: The researcher next visited a freshman apologetics course, which opened with prayer, followed by a short six-minute talk by the instructor that he used to rehash what had been covered during the previous class session. The instructor then turned the class over to a student who discussed the assumption of the Virgin Mary into heaven and her co-redemptrix nature. The texts for the course consisted of the Bible and the Second Vatican Council's dogmatic constitution entitled *Lumen Gentium*, which is a comprehensive edict on the Catholic Church's beliefs about Mary. The instructor offered coaching throughout the class and read a Bible passage regarding the assumption of Mary into heaven about an hour into the class, but otherwise remained in the background as the students discussed the day's topic, only joining in a total of eight times when asked or when needed. Throughout the class discussion, the students referred to each other as Mr./Ms. followed by the student's surname.

Wednesday 8-8:50 a.m.: Classroom Observation #4: The researcher's second day at Burgundy College began with a visit to a sophomore-level Trinitarian theology course in which the students were discussing, comparing and contrasting Karl Rahner's essay *The Trinity* with Jürgen Moltmann's book *The Trinity and the Kingdom.* This course did not open with a prayer, but instead with the instructor spending eight minutes discussing Rahner's work, which the class had discussed during the previous class period,

and then briefly introducing Moltmann's book. The instructor then asked the class whether they thought Rahner, after reading Moltmann, had split the trinity into three distinct entities. The class used both Rahner's and Moltmann's works to support their arguments, and the instructor often played the devil's advocate to help the students along in their thought process. The students referred to each other as Mr./Ms. followed by the student's surname during the discussion. The instructor remained actively engaged throughout the class, which lasted until the instructor closed the class with a Hail Mary prayer at 8:50 a.m.

Wednesday 9-9:50 a.m.: Classroom Observation #5: The next course, held in the same classroom as the Trinitarian theology course, was a junior-level physics course in which the students were discussing the work of pre-Socratic philosopher Thales of Miletus, and more specifically, Thales' principle that the Earth rests on water and is motionless. As much of the classroom discussion was rooted in the works of Aristotle because no work written by Thales himself survives today, the students routinely switched between discussing Thales and Aristotle, but the instructor was diligent in keeping their focus on Thales. The instructor was engaged throughout the class, often reading from Aristotle's work *De Caelo* and spurring debate amongst the students. The students referred to each other as Mr./Ms. followed by the student's surname during the discussion, and the class was opened and closed with student-led prayer.

Wednesday 10-10:50am: Classroom Observation #6: The researcher also was able to observe a senior-level comparative non-Western cultures course in which the students were reading Mourning Dove's 1927 novel *Co-ge-wea the Half Blood.* The instructor had the students recite a prayer to open the class and then discussed the life of

the book's author until 10:11 a.m.. This was the first day the class was discussing this particular book. The instructor then asked a student to give his take on the female central character in the book, and a rather intense group discussion followed; however, the formality remained as the students referred to each other as Mr./Ms. followed by the student's surname, even when the discussion became heated. The instructor remained active throughout the course by reading passages from the book and answering and asking questions, all in an attempt to, in the instructor's words, "distinguish the natural from the cultural." As the students dissected the different parts of the book, the instructor was always ready to ask them to distinguish between the natural and the cultural, which spurred the discussion that lasted the entire 50-minute class period.

Wednesday 1-1:50 p.m.: Classroom Observation #7: The sophomore-level course devoted solely to discussing the Gospel of John was opened with prayer by a faculty member who was also a member of the Catholic clergy. The students' Bibles served as their text, and most students had filled the margins with notes, which they used during the class discussion. This discussion centered around John's "higher Christology" and whether the author of this particular gospel was privy to information regarding Jesus' divine being before the authors of Matthew, Mark or Luke, all of whom regarded Jesus, as one student put it, as "a member of the general public." The instructor let the students guide the instruction and only twice interrupted to offer commentary on what may have been lost during the Hebrew or Latin to English translation process. These commentaries lasted five and eight minutes, respectively. The students referred to each other as Mr./Ms. followed by the student's surname during the discussion. The class was stopped short at 1:35 to accommodate a doctor's appointment that the instructor had scheduled.

Wednesday 2-2:50 p.m.: Classroom Observation #8: The junior-level patristic theology course opened with prayer led by the instructor. The students relied upon the book *The Works of Saint Augustine: A Translation for the Twenty-First Century* as source material for their discussion on whether or not strictly adhered to tradition is required in order for the Catholic Church to remain what was referred to in the class as the "universal church." The students, by and far, agreed with Saint Augustine, and the conversation was all but stagnant for the first 12 minutes. The instructor then asked the class, "When viewed through the lens of liberation theology as discussed by 20th-century theologian Gutiérrez, does strict tradition have a place in a universal church when so many people are experiencing so many different challenges in the world"?" The students, who again referred to each other as Mr./Ms. followed by the student's surname throughout the class, erupted into a conversation in which most defended tradition using passages from the Saint Augustine book, the Bible and references to various papal councils. Henceforth, the conversation required little guidance from the instructor, who only spoke four times during the next 30 minutes. The instructor stopped the class at 2:51 p.m., recapped the arguments from the day, offered a preview of the topic for the next class, and then dismissed the students at 2:53 p.m.

Thursday 9:30-10:50 p.m.: Classroom Observation #9: The researcher's third day on the Burgundy College campus began in a junior-level philosophy of law course that was discussing the United States Supreme Court Case *Texas v. Johnson*, in which Johnson was arrested under state statue for burning the American flag during a protest. The instructor opened the class with a prayer and then handed the students the facts pertaining to *Texas v. Johnson.* The instructor then asked the students whether the First

Amendment of the United States Constitution protected "speech that is not necessarily verbal." The students relied solely on copies of the United States Constitution, as well as the case narrative, as their source materials. The conversation rarely lacked momentum, and the instructor interrupted only five times between the beginning of the conversation at 9:36 a.m. and the end at 10:46 a.m. The interruptions were to introduce the students to two separate United States Supreme Court cases, *Stromberg v. California* and *Tinker v. Des Moines Independent Community School District*, both of which were cited in the Supreme Court's decision in *Texas v. Johnson*. Before dismissing the class, the instructor asked the students to vote by a show of hands if burning the American flag is free speech, which resulted in a 9-2 decision in the affirmative. The instructor dismissed the students at 10:44 after telling them that the Rehnquist Court agreed with the majority of them in its 5-4 decision. As in the other Burgundy College classrooms, the students referred to each other as Mr./Ms. followed by the student's surname during the discussion.

Thursday 1-2:20 p.m.: Classroom Observation #10: The researcher's second classroom observation for the day was in a senior-level southern literature course in which the students were discussing the short story *Down by the Riverside* from Richard Wright's 1938 book *Uncle Tom's Children*. The instructor began at 1:03 p.m. by asking the 12 students in the class about the southern culture portrayed in this book and whether it was different from what they had found in the previous short story they had read, *Big Boy Leaves Home*, also written by Wright. The instructor drew references from *Big Boy Leaves Home* for the first half of the class and then seemingly let *Down by the Riverside* stand for itself as the students recognized that the book's main character was a hero on multiple planes, although he was struggling with a fatal flaw. Whereas the instructor was

active in the discussion until 1:25 p.m., she only interrupted the students six times during the last 55 minutes of class as they discussed whether the main character deserved redemption from the murder he committed early in the story because of his later heroic actions. Consistent with the other observations, the students referred to each other as Mr./Ms. followed by the student's surname during the discussion.

Thursday 2:30-3:50 p.m.: Classroom Observation #11: The researcher's final observation for the day occurred in a junior-level medieval theology and philosophy course in which the students were discussing their interpretation of Hugh of Saint Victor's *De arca Noe mystica*, or the Mystic Interpretation of the Ark of Noah. The instructor was vital in this class because he offered Latin translations throughout and drew connections between the works of Hugh of Saint Victor and those of Saints Augustine and Bonaventure. The teaching method verged on lecture-style as the instructor spoke throughout; however, he would pepper the students with questions, and if an answer was not given right away, one was teased out as the instructor was able to recall comments from individual students throughout the course of the semester and use them to help the students find the answers the instructor was looking for. This class was small, containing only five students, so each student was called upon multiple times to answer the instructor's questions. The class was excused at 3:40 p.m.

Friday 8-8:50 a.m.: Classroom Observation #12: The researcher's final classroom observation at Burgundy College took place in a freshman-level logic course in which the students were reading the works of Chrysippus. The instructor was teaching his students to recognize the differences between atomic and molecular propositions; he wrote examples of each on the chalk board and let the students decide for themselves in

which category each example belonged. The course text was used sparingly; in fact, the researcher did not see any student with a text. Instead, the instructor made use of the white board in describing logical conjunctions and disjunctions. The class lasted the entire 50 minutes and was concluded with a student-led prayer. Of course, the students referred to each other as Mr./Ms. followed by their interlocutor's surname during the discussion.

Burgundy College Students' Perception of Their Own Critical Thinking Skills

As shown in Table 4.8, the students who participated in this project at Burgundy College gave themselves high marks in terms of their critical thinking ability and rated the Ennis-Weir test as fairly simple, which is shown as a mean score with the standard deviation in parentheses. The data in Table 4.8 is derived from items #9 and #19 on the questionnaire, which asked the students to rate their critical thinking ability on a 1 – 10 Likert scale (1=poor, 10=excellent) and the difficulty of the Ennis-Weir test on a 1 – 10 Likert scale (1=simple, 10=very difficult).

Table 8: Burgundy College Student Perceptions

	Critical Thinking Ability	Ennis-Weir Test Difficulty
Burgundy College Mean	8 (1.617)	2.357 (0.841)

The students at Burgundy College gave a lot of credit to their undergraduate institution for the development of their critical thinking skills. Many of the students who answered item # 10 on the questionnaire claimed that the Great Books curriculum helped them evaluate arguments from "different angles," "lenses," and "perspectives." Other Burgundy College students wrote about the great strides they had made in terms of their critical thinking ability between high school and college and wrote about their newly

acquired skills in logic, which they were applying to everyday discussions. A female junior summed up the feelings of her colleagues at Burgundy College in her answer to questionnaire item #10:

> My undergraduate education has had an enormous positive impact on my critical thinking ability. I have been in contact with controversial and convincing texts which have challenged my ability to think for myself. Nobody told me what to think, they only taught me how to think, which I believe to be one of the most important things I have ever learned.

In response to questionnaire item #27, which asked how their undergraduate education prepared them to complete the Ennis-Weir test, again the Burgundy College students were quick to praise the college and its instructors. Students wrote that their logic and philosophy courses helped them spot the fallacies and inconsistencies in the faux letter to the editor, as well as to form a superior argument to counter the author's flawed thinking. A male sophomore student wrote, "We evaluate Hegel, Kant, Plato, Keynes, etc. on a daily basis and that makes stuff like this pretty simple."

Burgundy College Students' College versus High School Academic Experiences

There is evidence of little change between the Burgundy College students' academic experiences in high school and college. The students were asked a series of questions pertaining to their study habits and test preparation techniques in high school and college, as well as time spent on social activities. The students also were asked about the average number of hours they studied outside of class in both high school and college. As shown in Table 4.9, only a slight difference exists between the mean number of hours

that the Burgundy College students spent studying outside of class in high school versus college. There are no appropriate statistical methods to analyze these numbers because of the small sample population.

Table 9: Burgundy College Students' Time Devoted to Studying Outside of Class

	High School	College
Weekly Study Hours:	10.071 (4.103)	9.214 (4.741)

The students in the Burgundy College sample who discussed the changes in their study habits between college and high school (questionnaire item #6) routinely mentioned that their college courses were much more enjoyable than the courses they had in high school. Six of the 14 students wrote about maturation in their study habits and/or moving away from social activities to preparing for their lives. Overall, 10 of 14 students in the Burgundy College sample mentioned their instructors' expectation that they come to class prepared to discuss the assigned topic, while 11 of 14 students mentioned the challenging nature of their college courses.

One sophomore who agreed to a face-to-face interview with the researcher said that his study habits had changed because he had realized, after his freshman year, that college was not about a "good and fun social life," but instead about studying and learning. The student told the researcher that Burgundy College fosters a healthy balance between academics and social life, but with a clear emphasis on the academics. This sentiment also was shared by a senior who said during her interview that she knew she had matured more than her sister, who was attending a state university in New England, both socially and academically because her sister was "all about the bars, boys and beaches." The interviewee mentioned that the social activities at Burgundy College

focused more on "making the world a better place through our faith," which seemed to her to be more worthwhile than what her sister was experiencing in college.

Burgundy College Students' Overall College Academic Experience

The majority (12 of 14) of the Burgundy College sample population expressed satisfaction with their undergraduate experience thus far. One junior praised the college for giving him the opportunity to conduct an in-depth look into himself and his opinions, and how those opinions relate to the truth and reality in the world. Four participants mentioned that their undergraduate experience had sharpened their reading, writing, and comprehension skills, while four others mentioned that their conversation and social skills had been strengthened. When answering item # 16 on the questionnaire (Overall, are you satisfied with your academic experience at this school? Why or why not?), a female sophomore wrote:

> Yes! I really get so much out of the Great Books program. I've seen SUCH an improvement in my work and organization of thoughts and communication since I've gotten here. It's like I am on a search for the truth, and just not some facts that others say are the truth, but the real truth that impacts the world and brings people closer to God. It's like it is transforming me and I really like the person I am becoming.

Two students who expressed dissatisfaction with their undergraduate experience were transfer students from another Great Books school that was shuttered in 2010 because of overwhelming financial mismanagement. Both of those students mentioned that it would have been better if they could have stayed at their original school.

Not only were the Burgundy College students satisfied with their overall academic experience, but when asked what aspects of the college curriculum had impacted their life the most, eight students in the sample population mentioned the faculty in a positive light. One student wrote that the faculty are not only great at the subject matter knowledge, but are also "good role models outside of the classroom who make sure you grow and learn in life and faith and take the extra time to make sure you do." Other students mentioned the small community of students and the life-long friendships that are forged at the school. Four students also mentioned that serving as class leader had raised their confidence level and taught them how to take on leadership roles.

When asked how the instruction that the Burgundy College sample had received could be used in real life situations, each and every participant mentioned that the thinking skills they had learned while on campus had served and would continue to serve them well in everyday life. In addition, the students mentioned improved communication and social skills, improved leadership abilities, a strong faith-based life and an ability to defend their faith. One senior who was interviewed praised Burgundy College and his experience there because of the way the curriculum had prepared him for life. The student recently had interviewed for acceptance into the graduate business school at Harvard University, and the interview panel had commented on how well he communicated and how well thought out his answers were. "They told me they were impressed how I handled myself in what most people think is a stressful situation. There was no stress for me because our tutors (instructors) put us through that same kind of thing every day."

Summary

Chapter 4 presented the findings and data analysis for the information gathered over the course of the project. The chapter began with the demographic data, which, when subjected to a Fisher's exact test, proved that the two sample populations involved in this project are very similar to each other. The chapter presented the results of the overall Ennis-Weir test scores and their observable differences. The chapter also presented the results of a series of chi square tests of independence at a 0.05 level of significance, which rejected the null hypothesis and proved that test scores were not dependent on the type of institutions attended. Chapter 4 also included the qualitative data gathered from both sample populations, including data from the questionnaires, interviews and low-inference classroom observations. Chapter 5 provides the reader with a summary of the study with suggestions for further research

Chapter 5: Discussion and Reflection

Overview

Discovering whether post-secondary education institutions can help students develop their critical thinking skills through a Great Books curriculum is an important underlying concern for this study. This issue is important because many, if not most, post-secondary institutions hold the development of critical thinking skills as one of their primary missions. In fact, a search of the Panther College website yielded dozens of references to the development of critical thinking skills on many different pages, including the section devoted to the students' parents, the section outlining the core curriculum, the main academics page, the main library page, the online learning page, and others. Furthermore, the development of critical thinking skills is so important that Facione (1990) referred to these skills as the basis of a rational and democratic society (p. 2).

The purpose of this study was to examine the critical thinking skills of students at two post-secondary institutions, one a contemporary institution that offers a core curriculum and degree specialization, and the other a Great Books institution that relies solely on primary documents and Socratic dialogue in the classroom. This study also examined qualitative data in order find any potential differences in the students' demographics, high school achievement, or study habits that could explain any differences between the two sample populations' critical thinking abilities. This examination was conducted by testing the following hypotheses and answering the following two research questions:

Hypothesis: Undergraduate students enrolled in a school focusing on liberal education will achieve higher test scores on a standardized critical thinking exam when compared to the test scores of students enrolled in a school that focuses on degree specialization.

Null Hypothesis: No differences will exist between the scores on a standardized critical thinking exam between undergraduate students enrolled in a school focusing on liberal education when compared to the scores of students who are enrolled in a school that focuses on degree specialization.

Research Question #1: Are there differences in how students think about critical thinking between students who attend a school that focuses on liberal education versus students who attend a school that focuses on degree specialization?

Research Question #2: Are there important differences in any academic and/or personal characteristics of students who attend a school that focuses on liberal education versus students who attend a school that focuses on degree specialization that can explain any disparity in the critical thinking ability of the two populations?

The following is a discussion of the findings for the above hypotheses and research questions. Following this discussion, as well as a brief summary of the conclusions, the researcher will address the possible implications for practitioners and offer recommendations for further research.

Findings Relative to Hypothesis #1

The hypothesis in this study is designed to find whether the sample population at Burgundy College will produce higher scores on the Ennis-Weir test when compared to

the scores produced by the sample population at Panther College. The researcher conducted this study at Burgundy College in March of 2012 and at Panther College in April of 2012. Both sample populations completed the Ennis-Weir test without any preparation beforehand to produce a cross-sectional analysis of both populations. The Ennis-Weir test is presented as a faux letter to the editor focusing on a parking issue in a small community. The participants are directed to respond to each argument made by the author of the letter and to assess whether the letter, as a whole, provides adequate support for the author's solution to the parking problem.

The Ennis-Weir test was selected because it was designed to be used with students from the seventh grade through college (Ennis & Weir, 1985); therefore, it could be assumed that the test would not be overly difficult for either sample population. In order to further assess the difficulty level, however, the sample populations were asked to rate the difficulty of the Ennis-Weir test on a 10-point Likert scale (1=simple, 10=very difficult). Both sample populations rated the Ennis-Weir test as being relatively simple, with a sample mean score of 2.363 (s=1.206) at Panther College and a sample mean score of 2.357 (s=0.841) at Burgundy College. This finding encourages the researcher to conclude that the students at one school did not feel as if they were at a disadvantage to the students at the other school because of the particular standardized exam used for this project.

As shown on Table 4.3, an observable difference exists between the two sample populations' overall scores on the Ennis-Weir test. Overall scores on this test can range from -9 to +29. The mean score for the Panther College sample population was 20.545 (s=5.410), and the mean score for the Burgundy College sample population was 25.857

(s=1.231). Any statistical analysis beyond the stated mean and standard deviation is inappropriate because of the small sample populations involved. However, it is apparent that the Burgundy students scored, on average, 5.312 points higher than their colleagues at Panther College. In addition, when the Ennis-Weir test scores were broken down by subscale, as show in Table 4.5, there were observable differences between the two sample populations' scores in all areas measured, including the ability to evaluate an argument, deduction, inference, assumption recognition, and interpretation. Again, any statistical analysis beyond the stated mean and standard deviation is inappropriate because of the small sample populations involved.

Based on the aforementioned observable differences, it appears that utilizing a Great Books curriculum, which is intended to develop critical thinking skills, has a strong positive effect on an undergraduate student's ability to think critically when faced with a common reasoning task. The aforementioned findings may also suggest that students who experience a Great Books curriculum may be better prepared to take a critical thinking test, such as the Ennis-Weir test, because they are trained to assess open-ended exercises in which critical thinking skills are necessary for success. Instructors in Great Books programs are more likely to employ open-ended questions on exams and during class sessions in order to force students to support statements with evidence and encourage students to make connections between different disciplines (Rothman, 2002). Whether the difference resulted explicitly from the content of the particular texts and documents used in the Great Books curriculum at Burgundy College, or from the training received from specific instructors in a particular course or set of courses, such as logic or philosophy, is a question that requires further explanation through future research.

Findings Relative to Research Question #1

In order to help answer Research Question #1, the researcher employed a Likert scale ranging from 1 (poor) to 10 (excellent) that asked the two groups of students to rate their critical thinking ability. The sample population at Panther College produced a sample mean of 7.909 (s=1.758), and the sample population at Burgundy College produced a sample mean of 8 (s=1.671). Any statistical analysis beyond the stated mean and standard deviation is inappropriate because of the small sample populations involved, however, this finding may indicate that, overall, the students in both sample populations shared the thought that their critical thinking skills were relatively high.

An observable difference seems to exist between the Panther College and Burgundy College sample populations in terms of how they define the term "critical thinking." Students at both schools used different phrases to define critical thinking, such as problem solving, the ability to reason, evaluating arguments, etc. However, the students at Panther College who offered examples of their critical thinking skills were, perhaps unknowingly, focusing on rote memorization. For instance, as described in Chapter 4, one student mentioned that his critical thinking skills were refined because he knew many facts to teach the students who will be in his future history classes, while another mentioned that he had over 1,000 Bible verses memorized but seemingly could not explain the meaning of his favorite verse or how it applies in today's world.

The students at Burgundy College found substantial freedom in their critical thinking skills, and nowhere did the researcher encounter any direct or indirect mention of rote memorization when questioning these students about their perception of their critical thinking abilities. Many of the Burgundy College students mentioned that they

had been trained *how to think and evaluate arguments* instead of *what to think about various arguments*. Most of them also mentioned courses, such as logic and philosophy, which have shaped and developed their ability to think critically. This would certainly reinforce Possin's (2008) claim that many philosophers, such as himself, believe that critical thinking skills are simply formal logic and can be refined through such courses.

As mentioned in the introduction to this chapter, Panther College has dozens of references to critical thinking published on their website, which may offer some insight into the disconnect between how the Panther College students define critical thinking and how the academy defines critical thinking. Perhaps the Panther College students are under the impression that the school is honing their critical thinking skills because they are seemingly inundated with the catchphrase "critical thinking." This inundation, combined with the type of classroom instruction and evaluation that takes place at Panther College, namely lectures and multiple choice exams, has perhaps distorted Panther College students' definition of critical thinking, as their examples of their critical thinking abilities do not line up with any of the definitions offered by the academy as discussed in Chapter 3. The students at Panther College may think they are getting the best education available, and they may think their critical thinking skills are being honed because they are told so, but the issue is that the students lack the comparative perspective to know whether they are receiving the instruction they are being told they are receiving.

Findings Relative to Research Question #2

Research question #2 was designed to validate the study's findings in the case that the project's hypothesis was proved true and statistically significant differences were

found in the sample populations' overall Ennis-Weir test scores. Research question #2 asked whether important personal and/or academic characteristics exist that may explain any disparity in the critical thinking ability of the two sample populations. The researcher evaluated the participants' demographics, high school grade point averages and college entrance exam scores, as well as qualitative data related to why they chose their particular post-secondary institution, community and campus observations, high school and college study habits, classroom observations and the sample populations' overall college experience.

The two sample populations were nearly identical in terms of mean age, gender, and family income, type of high school attended, race/ethnicity, class standing, and size of their hometown. In addition, the two sample populations' mean ACT scores (Panther College = 24.181, Burgundy = 25.642, *p*-value = .329) proved to be similar, as did their mean high school grade point averages (Panther College = 3.154, Burgundy College = 3.246, *p*-value .703) and cumulative college grade point averages (Panther College = 3.131, Burgundy College = 3.422, *p*-value = .148). The slight differences, all of which proved to be statistically insignificant, are not enough to conclude that the two sample populations in this project are different from one another in terms of the aforementioned categories. Furthermore, the researcher found very little difference between the two sample populations when asked why they chose their particular post-secondary institutions. Students from both schools mentioned family tradition, the school's reputation, friends, the Christian environment, etc. These remarks indicate the lack of any special characteristics amongst one sample population over the other that would lead to a difference in overall scores on the Ennis-Weir test.

The researcher noticed rather striking observable differences when observing the campus and community. In fact, whereas the community was very inviting and the campus rather cold toward the researcher during the Panther College visit, the community was cold but the campus very inviting during the Burgundy College visit. Furthermore, whereas the community in which Panther College was established enjoys the presence of the college and its students, the community of WNE is more suspicious of Burgundy College and its students. While many reasons may exist for these dichotomies, the researcher can only speculate on the source of the differences, such as Midwestern versus New England customs and traditions. These particular observations may be best left to further research in an appropriate social science discipline, as all of the students who participated in this project seemed like average college students, and the researcher found no major observable differences in behavior during the observation, testing or interviewing phase of the project.

The dramatic differences between these two sample populations appear to rest solely within their post-secondary experiences. When the researcher asked about the time the students devoted to studying outside of class, the Panther College students noted a drastic change in their study habits, as the time they devoted each week to studying outside of class while enrolled in high school generated a mean value of 9.727 hours, but dropped to 4.454 hours in college. Conversely, when the weekly mean number of hours devoted to studying outside of class for Burgundy College students, both in high school (10.071) and college (9.214), were analyzed, the researcher found very little change. Any statistical analysis beyond the stated mean and standard deviation is inappropriate because of the small sample populations involved.

The dramatic drop in the number of hours that Panther College students devoted to studying outside of class may be attributed to the number of student activities with which they are involved. One Panther College student mentioned that while he had more time to read and study in college, he was bombarded with social activities on campus. Another student told the researcher during an interview that it was difficult to tell whether academics were more important than extracurricular activities because of the way the college markets various groups. Other Panther College students mentioned participating in a large number of social and extracurricular activities, but blamed their participation on a lack of parental supervision. In fact, one student claimed to spend five to seven hours per day on social activities because his parents were not looking over his shoulder.

Overall, there was very little change between the amount of time the Burgundy College students studied outside of class each week in high school and college, and in fact, many of studied more in college. This phenomenon appears to be the result of the amount of work the Burgundy College students have to do to prepare for each class. The difference also may be attributed to the passive nature of most of the classes at Panther College, which may have conditioned the students to prepare only for exams because they do not expect to be challenged in class. On the other hand, the students at Burgundy College expect to participate and to be challenged in class, so they are responding to an extrinsic motivation to be prepared. The manner in which Panther College students handle the struggle between academics and social/extracurricular activities, and because they readily admit that such activities often win the battle over their time, gives credence to Adler's (1982) theory that the post-secondary education process in America has become a "rather pleasant way of passing time until we get ready to go to work" (1982).

The aforementioned passiveness in the classroom exhibited by students at Panther College was documented in the researcher's classroom observations. The courses at Panther College were overwhelmingly taught in a lecture format with little to no interaction between the students and the instructor. In addition, the researcher did not see any primary sources in the Panther College classrooms, though there were great interactions between the students and the instructor in at least one class (See Classroom Observations #6 and #7). However, there were other courses, such as described in Classroom Observations #1, #4, #5, #8, #9, and #11, in which little or no interaction took place between the students and the instructor. Many of the instructors adopted "sage on the stage" presence and only infrequently, if at all, interacted with their students. In classroom experiences such as these, as mentioned in Nussbaum (2010), the students may not be inclined to question what the instructor is teaching because they do not feel as if they are colleagues with the instructor and, therefore, defer to the instructor's authority. This deference only intensifies because their peers are going along with the instructor's ideas as well, which undoubtedly conditions the students to avoid analytic or critical thought during class.

In contrast, the students at Burgundy College were free to step back and analyze the primary documents and arguments they experienced in class from different angles and to dialogue with each other and with their instructor in a teacher/interlocutor situation. Each of the 12 Burgundy College classrooms the researcher visited was arranged around a single table to facilitate discussion between the instructor and the students. There were no stages to make the students feel as if the instructors were superior or more prestigious than the students. The only course at Burgundy College that resembled a lecture was

Classroom Observation #11, in which the instructor spoke during the majority of the class but asked dozens of questions and expected answers from the students. When a student was unable to answer the question as first presented, the instructor would rephrase the question or draw upon references from earlier in the semester in order to provoke the student to answer correctly. This sort of Socratic dialogue was simply absent at Panther College. This may be one reason why the majority of the students at Panther College paid more attention to their personal electronic devices during class and why such devices were a rare sight in the Burgundy College classrooms.

The final glaring disparity between the sample populations at Panther College and Burgundy College involved the students' overall satisfaction with their undergraduate experience. Many of the students at Panther College seemed to be second guessing their education, as many mentioned that very few of the courses they had completed would be relevant to "real life situations." Other students wrote and spoke openly about not being prepared for the real world or being downright unsatisfied, and perhaps misled, about job prospects for the chosen major. Finally, one student was able to highlight the struggle between the social/extracurricular life and the academic life at Panther College when she proclaimed during an interview that she was wholeheartedly satisfied with her undergraduate experience, namely because of the social/extracurricular nature of her experience.

This level of dissatisfaction did not exist at Burgundy College, with the exception of the feelings of the two students who had transferred from another Great Books school that had recently closed. The majority of students were able to articulate how the Great Books curriculum would benefit their lives. The students at Burgundy College believed

that they had the upper hand in many employment situations, even over students with specialized degrees, because of the thinking skills they had learned during their time on campus. In addition, whereas the Panther College students seldom praised their instructors, the Burgundy College students spoke of their instructors as if they were colleagues, friends, mentors, or even role models. Burgundy College embodied a real sense of *in loco parentis*, or the instructors filling the parental role while the students were away from home.

Summary of Conclusions

The major findings of this project can be summarized as follows:

1) The sample of students at Burgundy College, a post-secondary institution utilizing the Great Books curriculum, outperformed the sample of students at Panther College, a contemporary post-secondary institution offering degree specialization and a core curriculum, on the Ennis-Weir Critical Thinking Essay Test.

2) There is an observable difference in the way the students in the two sample populations think about their critical thinking ability, although both sample populations rated their critical thinking ability similarly on a 10-point Likert scale. The Panther College students often confused critical thinking ability with rote memorization, while the Burgundy College students often used definitions that have been accepted in academe.

3) The two sample populations were relatively similar in regards to age, gender, family income, type of high school attended, race/ethnicity, class standing, and the size of their hometown. The two sample populations had similar high school grade point

averages, college entrance exam scores, and cumulative college grade point averages, as well.

4) The classes at Panther College and Burgundy College are taught differently.

5) The major observable differences between the two sample populations, in terms of academic, social, and extracurricular activities, seem to have begun at their respective post-secondary institutions.

6) The sample of students at Burgundy College, who are exposed to the Great Books curriculum, have experienced observable benefits in their ability to think critically and are more satisfied with their undergraduate experience than the sample of students at Panther College.

Implications and Recommendations for Practitioners

Bok (2006) noted that it is "impressive to find faculty members agreeing almost unanimously that teaching undergraduates to think critically is the principal aim of undergraduate education" (p. 109). Critical thinking is a catchphrase in education that, when heard, conjures the notion of good teaching and a quality education; however, many colleges are caught up in a race to provide the most entertaining four years, along with the most luxurious accommodations possible, all in order to fill their campus with new undergraduates and the financial aid packages that come with them. Teaching and learning become almost an afterthought; a need certainly exists to bring back the focus to academics and true cultivation of critical thinking skills because, as also mentioned in Bok (2006), the sheer volume of information in today's world makes it nearly impossible to know what is most important to teach, so it would be best to teach our undergraduates how to ask pertinent questions in order to come to carefully thought-out decisions.

Drastic changes may not be required to develop the critical thinking skills that undergraduates so desperately need. It would be wise for college administrators to discontinue the practice of assuming that a master's degree, doctorate, or other terminal degree automatically signals that the holder is competent in the classroom and that individual professors should be given the discretion to develop their own teaching methods. Surveys such as Gardiner's (1994) on producing dramatic gains in student learning show that close to 90% of instructors feel as if their teaching methods are above average (p. 57). While one can almost be certain that the content most professors are teaching is current simply because members of academe tend to stay abreast of the latest research, one cannot be so certain that professors are learned in different teaching methods, such as collaborative learning, experiential learning, problem-based learning, etc., so the university must turn its attention to teaching professors about instructional best practices, just as the faculty at Burgundy College are trained in using the Socratic Method.

Typical faculty orientation and training days include welcome speeches from various college officials and an introduction to student support services and student activities, as well as quick lessons on the Family Educational Rights and Privacy Act (FERPA), accreditation, sexual harassment prevention, and campus safety. This sort of training is invaluable as it serves as an orientation to the institution and its culture; however, these types of sessions only partially fulfill the instructor induction best practices as outlined by Lyons (1996). Lyons stresses that instructors need adequate training in fundamental teaching and classroom management, both initial and ongoing professional development, and recognition for quality work. Unfortunately, Gappa and

Leslie (1993) found there is rarely any mandated training for instructors in areas such as learning styles, formative and summative assessment, or classroom management, all of which are fundamental to the learning process and are included in instructional best practices. Gappa and Leslie (1993) concluded that "where faculty do not have the proper tools to do their jobs (i.e., training and support)… it is usually because the institution has failed in some significant way to provide what is needed" (p. 13).

The role of colleges and universities before the elective-based system became prominent after 1899 was not necessarily to teach students a certain skill, but instead to teach students to find the truth for themselves, thus naturally developing their critical thinking ability. Students today not only thrive in an environment in which they are free to dialogue with their instructor and fellow students, but they also achieve greater success when they are provided with formative assessments and regular feedback. These techniques promote good performance by not only clearly defining what type of work is expected in class and how to achieve high standards, but also by showing students that high performance standards are achievable. Again, instructors exposed to instructional best practices are steeped in various forms of formative assessment and regular feedback, which is why a retooling of most instructor induction programs is needed to incorporate instructional best practices.

Students, such as those at Panther College, are predominately exposed to lectures and PowerPoint presentations that only promote rote memorization. Students who are held to the expectation of reading the assigned material and partaking in Socratic dialogue will have their invaluable critical thinking skills naturally awakened when they are free to dialogue with each other and when they have the opportunity to analyze

primary documents and theories from various angles. Imparting critical thinking skills requires instructors to move away from simply presenting information in a lecture format and to, as described by Hativa (2000), act more as a chairperson, guide, listener, observer, monitor, initiator, summarizer, and referee (p. 111). Instructors must cease simply talking *to* their students and start listening to and talking *with* their students as they discover their own learning process. These skills do not come naturally for most instructors, but they can certainly be learned during instructor induction sessions based on instructional best practices.

Recommendations for Further Research

Students who were exposed to the Great Books curriculum and who were trained to analyze primary sources and documents through the use of Socratic dialogue scored higher on the Ennis-Weir test and were better at thinking critically than their colleagues at a contemporary, elective-based school focusing on degree specialization. Whether Burgundy College students' critical thinking ability gradually progresses over their four years at the institution remains an open question. One possible direction for future research would be a longitudinal study over the course of students' entire undergraduate careers to see whether there is continual improvement. This data also would help determine whether the Burgundy College students' critical thinking skills can be attributed to the overall Great Books curriculum, or perhaps a specific course or series of courses, such as logic and philosophy.

Further research should also be conducted regarding whether instituting a Great Books curriculum, which utilizes primary sources and Socratic dialogue in the classroom, should wholly replace a school's core curriculum in order to give undergraduates a firm

foundation of critical thinking skills before they move on to their specialized degree programs. Furthermore, in the same vein, further research should be conducted on college honors programs that purport to develop a student's critical thinking ability without introducing students to the Great Books curriculum, in an attempt to discover whether a Great Books format would be more challenging and enjoyable to those students.

Teaching aimed at developing a student's critical thinking skills is not an easy task, and administrators can no longer assume that an advanced degree signals knowledge of sound teaching methods; therefore, further research must be conducted on faculty knowledge of best practices in student learning and education. Such research may uncover the need to imbed an instructor training course into PhD programs or provide further professional development on college campuses aimed at teaching instructors how to develop critical thinking skills. The research may also uncover a need to provide instructors with ongoing support as they learn to make the content of their courses more challenging and rewarding for their students.

Summary

As colleges and universities in the United States move further away from higher education's foundation in liberal education by slashing the core curriculum, students are losing their opportunity to develop critical thinking skills through the use of primary documents and Socratic dialogue in the classroom. They will more than likely be resigned to graduate with a degree that no longer signals that the holder is an educated individual but instead one that simply signals persistence, attendance, and the ability to memorize concepts, if only temporarily to get themselves through to the next exam.

Educators and post-secondary administrators need to heed this warning and not only develop instructor induction and training that encourages the use of primary documents and Socratic dialogue in the classroom, but create an environment in which the core curriculum is viewed more as a priority than a bother.

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Appendix A
Burgundy College Reading List

Readings for Part 1: The Ancient World

- *The Epic of Gilgamesh*
- Homer, *Iliad*, *Odyssey*
- Hesiod, *Theogony*
- Aeschylus, *Agamemnon, Choephoroe*, *Eumenides, Promethius Bound, The Suppliants*
- Sophocles, *Oedipus Rex, Oedipus at Colonus*, *Antigone, Philoctetes*
- Euripides, *The Bacchae, Medea, Alcestis, Hippolytus*
- Aristophanes, *Acharnians, The Clouds*, *Peace, Lysistrata*, *Frogs*, *Birds*
- Herodotus, *The Histories*
- Thucydides, *The Peloponnesian War*
- Plutarch, *Theseus, Solon, Cimon, Nicias, Themisticles, Aristides, Lycurgas*, *Pericles, Alcibiades, Alexander*
- Plato, *Euthyphro, Philebus, Timaeus, Meno, Phaedrus, Republic, Apology, Crito, Phaedo, Laws*
- Aristotle, *Ethics, Politics, Poetics*
- *Selected books from the Old Testament*

Readings for Part 2: Introduction to Philosophical Inquiry

- Golding, *Lord of the Flies*
- Dostoevsky, The Grand Inquisitor from *The Brothers Karamazov*
- Freud, *The Future of an Illusion*
- Tocqueville, *Democracy in America*
- Camus, *The Stranger*
- St. Exupery, *Wind, Sand and Stars*
- Nietzsche, *Beyond Good and Evil*
- Frankl, *Man's Search for Meaning*
- Pieper, *Leisure, the Basis of Culture*
- The Venerable John Paul II, *Fides et Ratio*
- Guardini, *The Death of Socrates*

Philosophy & Humanities Seminar III:
Greece, Rome, and the Birth of Christianity

- The Presocratics, *Fragments*
- Aristotle, *Physics, Metaphysics, De anima*

- Sacred Scripture, *I & II Maccabees*
- Plutarch, *Alexander, Marius, Sulla, Caesar, Crassus, Pompey, Cicero, Coriolanus, Marcus Brutus, Antony*
- Livy, *The Early History of Rome*
- Polybius, *The Rise of the Roman Empire*
- Cicero, *Catilinarian Orations, Philippicae*
- Sallust, *The Conspiracy of Catiline*
- Caesar, *The Conquest of Gaul*
- Vergil, *Aeneid*
- Horace, *Epodes, Odes*
- Suetonius, *Life of Horace*
- Ovid, *Metamorphoses*
- Seneca, *On the Tranquility of Mind*
- Sacred Scripture, *Selections from the New Testament*
- *The Martyrdom of St. Polycarp of Smyrna*
- *The Martyrdom of Sts. Perpetua & Felicity*
- St. Justin Martyr, *First Apology*
- St. Irenaeus of Lyons, *Against Heresies*
- Origen, *Commentary on the Song of Songs, On Prayer*
- St. Athanasius, *On the Incarnation, The Life of Antony*
- St. Syncletica, *Sayings*
- St. Cyril of Jerusalem, *Procatechesis, Catecheses, Mystagogic Catecheses*
- Egeria, *Itinerarium*
- St. Augustine, *Confessions, De doctrina Christiana, City of God, Sermons on the Psalms*
- Prudentius, *Psychomachia*
- Ambrosian Chant
- Pseudo-Dionysius the Areopagite, *The Mystical Theology*

Philosophy & Humanities Seminar IV:
The Medieval Flowering of Christendom

- Boethius, *The Consolation of Philosophy*
- St. Benedict, *Rule*
- St. Gregory, *Life of St. Benedict*
- *Beowulf, Wanderer, Seafarer, Dream of the Rood, The Ruin, Battle of Maldon, Song of Roland*
- *Sir Gawain and the Green Knight* (+ Arthurian material)
- Readings from St. Anselm and Gaunilo
- Blessed Hildegard of Bingen, *Ordo virtutum*

- St. Bonaventure, *Life of St. Francis, The Mind's Road to God*
- Abelard, *O quanta qualia*
- Blessed Jacobus de Voragine, *The Golden Legend*
- Readings from Alfarabi & Maimonides
- St. Thomas Aquinas, *Summa theologiae*
- Readings from Giles of Rome, John of Paris, Marsilius of Padua, Ockham and Fortescue
- *Selected chansons from the Troubadours*
- *Everyman, Second Shepherd's Play, Abraham and Isaac*
- Dante, *La Vita Nuova, La Divina Commedia, Letter to Can Grande*
- Machaut, *Messe de Nostre Dame, Rose liz*
- Scotus, *"On Metaphysics"*
- The Limbourg brothers, *Les Très Riches Heures du Duc de Berry*
- Chaucer, *Canterbury Tales*
- *Selections from the Old and New Testaments*

Philosophy & Humanities Seminar V:

Renaissance, Reformation, Catholic Renewal, & the Early Modern Stage

- Petrarch, "Letter to Posterity," "The Ascent of Mount Ventoux," *Canzoniere*
- Pico della Mirandola, *Oration on the Dignity of Man*
- St. Thomas More, *Utopia*
- Columbus, "The Journal of Christopher Columbus"
- Erasmus, *In Praise of Folly, The Freedom of the Will*
- Luther, *The Bondage of the Will* and other writings
- Calvin, *Institutes*
- St. John Fisher, *A Spiritual Consolation*
- St. Thomas More, *A Dialogue of Comfort Against Tribulation*
- Southwell, *An Epistle of Comfort*
- St. Ignatius of Loyola, *The Spiritual Exercises*
- St. Teresa of Avila, *Vida, The Interior Castle*
- Thomas Kempis, *The Imitation of Christ*
- *Decrees from the Council of Trent*
- St. John of the Cross, *Poems*
- St. Frances de Sales, *Introduction to the* Devout Life
- Palestrina, *Pope Marcellus Mass*
- Montaigne, That to Philosophize Is to Learn How to Die
- Machiavelli, *The Prince, Discourses, Mandragola*
- Marlowe, *Dr. Faustus*

- Shakespeare, Selected sonnets, *Macbeth, Hamlet, The Tempest, Henry V, King Lear, Twelfth Night, The Winter's Tale, Othello, Romeo and Juliet, Richard II, Henry IV, Part 1, Midsummer Night's Dream, Merchant of Venice, The Tempest, Julius Caesar, Coriolanus,* & *Antony and Cleopatra*
- Donne, *Selected Poems*
- Cavalier poets, selected poems
- Calderon del la Barca, *Life Is a Dream, The Great Theater of the World*
- Corneille, *Le Cid*
- Balthasar Gracian, *The Art of Worldly Wisdom*

Philosophy & Humanities Seminar VI:

The Dialectics of Enlightenment

- Kant, "What is Enlightenment?"
- Cervantes, *Don Quixote,* Selection
- Bartolem de Las Casas, "Brief Account of the Devastation of the Indies"
- *Selected Slave Narratives*
- Bradstreet, *Selected Poems*
- Hobbes, *Leviathan*
- Bossuet, *Politics Drawn from the Very Words of Holy Scripture*
- Descartes, *Meditations on First Philosophy*
- Locke, *Essay Concerning Human Understanding, Second Treatise of Government*
- Hume, *An Enquiry Concerning Human Understanding*
- Berkeley, from the *Treatise Concerning the Principles of Human Knowledge*
- *The American Puritans: Their Prose and Poetry*
- Milton, When I consider how my light is spent, Areopagitica, *Paradise Lost*
- Pascal, *Pensées*
- Molière, "The Misanthrope"
- Racine, *Iphigenia*
- Swift, *Satirical Works*
- Leibniz, Essays on Theodicy
- Voltaire, *Candide*
- dAlembert, Preliminary Discourse
- Johnson, "Plan of a Dictionary of the English Language," "Preface to Shakespeare"
- Rousseau, *Discourse on Inequality, The Social Contract*
- Smith, *Wealth of Nations*
- *The Declaration of Independence*
- *The Articles of Confederation*
- *Selected Federalist and Antifederalist Papers*

- *The United States Constitution*
- *Speeches and Decrees from the French Revolution*
- Burke, "Reflections on the Revolution in France"
- Kant, *Prolegomena to Any Future Metaphysics, Groundwork to the Metaphysics of Morals*
- Hegel, *The Philosophy of History*
- Tocqueville, *Democracy in America, The Old Regime*
- Hawthorne, *The Scarlet Letter,* "Young Goodman Brown," "The Birthmark"
- Emerson, "Self-Reliance," "The Over-Soul," "Divinity School Address"
- Melville, *Moby Dick*
- Thoreau, *Walden*, "Civil Disobedience"
- Flaubert, *Madame Bovary*
- Dostoevsky, *Crime and Punishment*
- *Selected Speeches: Calhoun, Webster, Lincoln*
- *Selected Court Cases*
- *The Lincoln-Douglas Debates*
- Mark Twain, *Adventures of Huckleberry Finn*

Philosophy & Humanities Seminars VII & VIII:

Late Modernity and Postmodernity

- Arendt, *On Revolution*
- Dostoevsky, *The Possessed*
- Marx, *The Economic and Philosophic Manuscripts of 1844, Theses on Feuerbach*
- Kierkegaard, *Philosophical Fragments, Fear and Trembling*
- The Venerable John Henry Newman, *Apologia pro vita sua*
- St. Therese of Lisieux, *Story of a Soul*
- *Documents of the First Vatican Council*
- Hopkins, "The Wreck of the Deutschland," "Pied Beauty," "God's Grandeur"
- Whitman, "Song of Myself"
- Dickinson, selected poems
- Chesterton, *The Napoleon of Notting Hill*
- Sojourner Truth, "Ain't I a Woman?"
- Douglass, "What to the Slave is the fourth of July?"
- Washington, "Up From Slavery"
- Du Bois, "Of Mr. Booker T. Washington and Others," "The Parting of the Ways," "The Talented Tenth: Memorial Address"
- Conrad, *Lord Jim; Heart of Darkness*
- *Twelve Southerners, I'll Take My Stand: The South and the Agrarian Tradition*
- Nietzsche, *The Birth of Tragedy, Thus Spoke Zarathustra*

- Freud, *Civilization and Its Discontents, The Interpretation of Dreams, selections*
- Heidegger, *Being and Time*
- Pound, "Salutation," and "Ballad of the Goodly Fere," "What I Feel About Walt Whitman," "The Tradition," "James Joyce, At Last the Novel Appears," and "Paris Letter, May 1922"
- Joyce, *Portrait of the Artist as a Young Man*, selections from *Ulysses*
- Eliot, *The Waste Land*
- Crane, *The Bridge*
- Stravinsky, *Oedipus Rex*
- GarcÍa-Marquez, *One Hundred Years of Solitude*
- Porter, "Flowering Judas"
- O'Connor, "Revelation"
- Hemingway, *The Sun Also Rises*
- James, *The Beast in the Jungle*
- Voeglin, *The New Science of Politics*
- Jung, selections
- Wilder, *Our Town*
- Copland, *Suite from Our Town*
- O'Neill, *Mourning Becomes Electra*
- Tate, "Ode to the Confederate Dead"
- Lowell, "For the Union Dead"
- Copland & Graham, *Appalachian Spring*
- Frost, "Dust of Snow," "The Rose Family," "The Line Gang"
- Carter, settings of Dust of Snow, The Rose Family, and The Line Gang
- Belloc, *The Servile State*
- Chaplin, *Modern Times*
- Kafka, *The Metamorphosis*
- Fitzgerald, *The Great Gatsby*
- Huxley, *Brave New World*
- Camus, *The Rebel*
- Arendt, *Totalitarianism*
- Riefenstahl, *Triumph of the Will*
- Levi, *Survival in Auschwitz*
- Celan, "Todesfuge"
- Sauvage, *Weapons of the Spirit*
- Resnais, *Night and Fog*
- Solzhenitsyn, *One Day in the Life of Ivan Denisovich*
- Selections from Sartre, Camus, Jaspers, Marcel, and Ricoeur
- Sartre, *Existentialism is a Humanism*
- Heidegger, "The Letter on Humanism"

- Beckett, "Waiting for Godot"
- Benjamin, "The Concept of History"
- Adorno, *Negative Dialectics*
- Foucault, "What is Enlightenment?"
- DeLubac, Henri, *Drama of Atheist Humanism, Paradoxes*
- King, *Letter from the Birmingham Jail*
- MacIntyre, *After Virtue*
- Vaclav Havel, "The Power of the Powerless"
- *The Documents of the Second Vatican Council*
- Blessed Pope John Paul II, *Fides et ratio*
- Pope Benedict XVI, *Deus caritas est, Spe salvi*

Revelation and Sacred Scripture

- CCC (2nd Rev. Ed.) nn. 1-1065
- The Companion to the Catechism of the Catholic Church
- The Holy Bible (RSV, 1st Catholic Ed.)
- Selected sermons and biblical commentaries from the Church Fathers
- Daniel Harrington, S.J., *How do Catholics Read the Bible?*
- Yves Congar, O.P., *Tradition and Traditions: An Historical and Theological Essay*
- Joseph Ratzinger, *'In the Beginning…': A Catholic Understanding of the Story of Creation and the Fall*

Apologetics

- Bl. John Paul II, *Fides et Ratio*
- John Cottingham, *Why Believe?*
- C.S. Lewis, *The Problem of Pain*
- Stephen M. Barr, *Modern Physics and Ancient Faith*
- Janet Smith, *Humanae Vitae: A Generation Later*
- Stephen T. Davis, "Was Jesus Mad, Bad, or God?"
- Jeffrey E. Brower & Michael Rea, "Understanding the Trinity"
- Peter Kreeft & Ronald Tacelli, *Handbook of Catholic Apologetics: Reasoned Answers to Questions of Faith*

Catholic Moral Teaching

- CCC 1691-2557
- Bl. John Paul II, Veritatis Splendor, Evangelium Vitae, Familiaris Consortio
- Pope Benedict XVI, Caritas in Veritate

- Pope Pius XI, Casti Connubii
- Pope Paul VI, Humanae Vitae
- Karol Wojtyla (John Paul II), Love and Responsibility
- Servais Pinckaers, O.P., Morality: The Catholic View
- Amy & Leon Kass (eds.), Wing to Wing, Oar to Oar: Readings on Courting and Marrying
- Matthew Levering (ed.), On Marriage and Family: Classic and Contemporary Texts

Trinitarian Theology & Christology

- St. Athanasius, On the Incarnation, Orations against the Arians
- Eusebius, Letter from the Council of Nicaea
- St. Gregory of Nyssa, An Answer to Ablabius: That we should not Think that There are Three Gods, The Catechetical Oration [The Great Catechism]
- St. Basil, On the Holy Spirit
- St. Ambrose, On the Holy Spirit
- Nestorius, First Sermon against the Theotokos
- St. Cyril of Alexandria, Second Letter to Nestorius, On the Unity of Christ
- Pope St. Leo the Great, Epistle to Flavian
- St. Augustine, De Trinitate
- St. Anselm, Cur Deus Homo
- St. Thomas Aquinas, Summa Theologiae Ia, qq. 27-43 (selections); IIIa, qq. 1-8, & 46-48
- Bl. John Duns Scotus, Ordinatio III, d. 7, q. 3
- Hans urs von Balthasar, Does Jesus Know Us—Do We Know Him?
- Karl Rahner, The Trinity
- Yves Congar, I Believe in the Holy Spirit
- Bl. John Paul II, Redemptor Hominis
- Pope Benedict XVI, Jesus of Nazareth (Parts 1 & 2)

Ecclesial & Eucharistic Communion

- CCC 1066-1134 & 1322-1419
- Lumen Gentium
- Redemptionis Sacramentum
- Bl. John Paul II, Ecclesia de Eucharistia
- Pope Benedict XVI, Sacramentum Caritatis
- Joseph Ratizinger, Called to Communion: Understanding the Church Today
- Avery Dulles, Magisterium: Teacher and Guardian of the Faith

- St. Thomas Aquinas, Summa Theologiae IIIa, qq. 73-83 (Treatise on the Eucharist)
- Abbot Anscar Vonier, A Key to the Doctrine of the Eucharist
- Roch Kereszty, Wedding Feast of the Lamb: Eucharistic Theology from a Historical, Biblical, and Systematic Perspective

Sacramental & Liturgical Life in Christ

- CCC 1135-1321 & 1420-1691 & 2558-2865
- Cyril of Jerusalem, Lectures on the Christian Sacraments
- Egeria, Itinerarium
- General Instruction of the Roman Missal
- Joseph Jungmann, The Mass of the Roman Rite
- Eric Palazzo, A History of Liturgical Books
- Jean Corbon, Wellspring of Worship
- Joseph Ratzinger, The Spirit of the Liturgy

Quadrivium: Music I & II

- *Sacred Scripture*
- *Missal Gregorian*
- *Jubilate Deo*
- Homer, *The Odyssey*
- Hesiod, *Theogony*, *Works and Days*
- Plato, *Republic*, *Timaeus*, *Phaedo*
- Aristotle, *Politics*
- St. Clement of Alexandria, Protrepticus, Paedagogus
- St. Basil the Great, Homily on Psalm I
- St. Augustine, *Confessions*
- Pope St. Pius X, *Tra le Sollecitudini*
- The Venerable Pope Pius XII, *Mediator Dei*, *De musica sacra et sacra liturgia*
- The Fathers of the Second Vatican Council, *Sacrosanctum concilium*
- Sacred Congregation of Rites, *Musicam sacram*
- The Venerable Pope John Paul II, Chirograph on Sacred Music
  Ratzinger, Selected writings on sacred music and the liturgy
- USCCB, *Sing to the Lord: Music in Divine Worship*
- *Catechism of the Catholic Church*
- *Worship*
- Kerman & Tomlinson, *Listen*
- Benward & Saker, *Music in Theory and Practice*

Art I & II

- Arnheim, *Art and Visual Perception*
- Feynman, Color Vision, Mechanisms of Seeing
- Held, Plasticity in Sensory-Motor Systems

Trivium: Logic

- Aristotle, *Categories*, *On Interpretation*, *Prior Analytics*, *Posterior Analytics*, *Topics*, *Sophistical Refutations*
- Porphyry, *Isagoge*

Quadrivium: Euclidean Geometry

- Euclid, *Elements*

Quadrivium: Astronomy

- Ptolemy, *Almagest*
- Copernicus, *On the Revolutions of the Heavenly Spheres*
- Kepler, *Epitome of Copernican Astronomy*
- Galileo, Starry Messenger
- Descartes, *Discourse on Method*
- Bacon, *The New Organon*

Quadrivium: Physics

- Galileo, *Dialogues Concerning Two New Sciences*
- Newton, *Principia*, *Selected Letters*
- Feynman, *The Feynman Lectures on Physics*
- Einstein, *Relativity*
- Heisenberg, The History of Quantum Theory from *Physics and Philosophy*
- Selected papers from *The Scientific American*

Biology

- Aristotle, *History of Animals*, *On Generation and Corruption*, *Parts of Animals*, *De anima*
- Margulis, *Five Kingdoms*
- St. Augustine, *De Genesi ad litteram*
- Darwin, *Origin of Species*

- Dawkins, *The Selfish Gene*
- Gould, *The Pandas Thumb*
- Lack, Darwin's Finches
- Eiseley, *The Immense Journey*
- Augros & Stanciu, *The New Biology*
- Mendel, *Experiments in Plant Hybridization*
- Watson, *The Double Helix*
- Hofstadter, *Metamagical Themas*
- Rock, *Perception*
- McCulloch, *Embodiments of Mind*
- Tinbergen, The Shell Menace
- Lorenz, *The Foundations of Ethology*, *King Solomon's Ring*
- Fabre, *The Insect World of J. Henri Fabre*
- Frisch, Dialects in the Language of the Bees
- Frisch & Lindauer, The Language and Orientation of the Honey Bee
- Sacks, *The Man Who Mistook His Wife for a Hat*
- Penfield, *The Mystery of the Mind*
- Other selected articles from scientific journals

Comparative Non-Western Cultures

- Nakamura, *Ways of Thinking of Eastern Peoples: India, China, Tibet, Japan*
- Standing Bear, *Land of the Spotted Eagle*
- *The Bhagavad Gita*
- *The Dhammapada*
- *The Upanishads*
- Befu, *Japan: An Anthropological Introduction*
- Chuang Tzu, *The Inner Chapters*
- Confucius, *Analects*
- Hsu, *Americans and Chinese*
- Lao Tzu, *Tao Te Ching*
- Rowley, *Principles of Chinese Painting*
- Fenollosa, *The Chinese Written Character as a Medium for Poetry*
- Suzuki, *Zen and Japanese Culture*
- *The Quran*

Appendix B
Burgundy College Curriculum

First Year						
Fall	Revelation & Sacred Scripture	*Quadrivium*: Music I & Choir	Ancient Greece & Philosophy I	*Trivium*: Logic	*Trivium*: Writing Workshop I	*Trivium*: Greek or Latin
Spring	Apologetics	Music II & Choir	Ancient Greece & Philosophy II	*Quadrivium*: Geometry	*Trivium*: Writing Workshop II	Greek II or Latin II
Second Year						
Fall	Catholic Moral Teaching	Musical Canon I & Choir	Greece, Rome, and the Birth of Christianity	*Quadrivium*: Astronomy	Writing Workshop III	Greek III or Latin III
Spring	Trinitarian Theology & Christology	Art & architecture in the Eternal City	The Medieval Flowering of Christendom	-------	Writing Workshop IV	Greek IV or Latin IV
Third Year						
Fall	Ecclesial and Eucharistic Communion	Art I & Choir	Renaissance, Reformation, & Catholic Renewal	*Quadrivium*: Physics I	-------	Greek V or Latin V *optional*
Spring	Sacramental and Litrugical life in Christ	Art II & Choir	The Dialectics of the Enlightenment	*Quadrivium*: Physics I	-------	Greek VI or Latin VI *optional*
Fourth Year						
Fall	Theology VII *optional*	New England Galleries & Choir	Late Modernity & Postmodernity I	Biology I	Comparative Non-Western Cultures I	Greek VII or Latin VII *optional*
Spring	Theology VIII *optional*	Musical Canon II & Choir	Late Modernity & Postmodernity II	Biology II	Comparative Non-Western Cultures II	Greek VIII or Latin VIII *optional*

Appendix C
Project Data Sheet

1. What is your gender? ____ Male ____ Female

2. What is your age? _____

3. Which of the following best describes your current class rank?

____ Freshman ____ Sophomore ____ Junior ____ Senior ____ Other

4. Which of the following best describes your race/ethnicity?

____ White, non-Hispanic
____ Hispanic
____ Native American
___ African-American
___ Asian-Pacific Islander
____ Other (please specify):

5. Which of the following best describes your hometown?

____ Farm (in the country with few surrounding neighbors)
____ Rural Community (population under 1,000)
____ Small Community (population 1,001 – 4,000)
____ Medium Sized Community (population 4,001 – 10,000)
____ Large Community (10,001 – 40,000)
____ Small Urban Center (40,001 -100,000)
____ Medium Urban Center (100,001 – 500,000)
____ Large Urban Center (over 500,000)

6. Which of the following best describes your annual family income?

____ Under $ 20,000 ____ $ 20,001 to $ 45,000
____ $ 45,001 to $ 100,000 ____ Over $ 100,000

7. What is your major(s) or planned major, if any?_____

8. What is your current status?

____ full-time degree-seeking ____ part-time degree-seeking

____ full-time non-degree seeking ____ part-time non-degree seeking

9. What kind of high school did you attend? _____ Public _____ Private _____ Home School

10. What is your current GPA? _____

11. What was your high school GPA? _____

12. What was your ACT/SAT Score? _____

Appendix D
Questionnaire

1) Did you read for pleasure before college? ____ Yes ____ No

A. If yes, on average, how many hours per week did you read for pleasure? _____

B. If yes, which genre interested you most? _____

2) Do you read for pleasure now that you've enrolled in college? _____ Yes _____ No

A. If yes, on average, how many hours per week do you read for pleasure? _____

B. If yes, which genre interests you most? _____

3) If there is a change in your reading habits between high school and college, please explain what you think has caused that change:

4) On average, how many hours per week did you study outside of class while in high school? _____

5) On average, how many hours per week do you study outside of class for your college courses? _____

6) If there is a change in your study habits between high school and college, please explain what you think has caused that change:

7) Why did you choose to attend this post-secondary institution (college/university)?

8) On a scale of 1-10 (1 = poor and 10 = excellent) how would you rate your critical thinking ability? _____

9) How do you think your undergraduate education has impacted your critical thinking ability?

10) How do you generally prepare for your classes on a daily basis?

11) Is how you prepare for classes today different from the way you prepared for class in high school?

12) How do you generally prepare for a test or exam today?

13) Is how you prepare now for a test or exam different from the way you prepared for a test or exam in high school?

14) What do you plan on doing after you receive your bachelor's degree (type of career, grad school, etc…)?

15) Overall, are you satisfied with your academic experience at this school? Why or why not?

16) Which aspects of the college curriculum (classes, projects, internships, majors, etc…) have both positively and negatively impacted your life the most?

17) Overall, from the time you were in high school until now, is there a difference in the amount of time you spend on social activities? Please explain:

18) How do you define critical thinking and what are some characteristics/aspects of critical thinking?

19) On a scale of 1 – 10 (1=Simple 10=Very Difficult), how difficult was it to complete the Ennis-Weir Critical Thinking Essay Test? _____

20) Overall, how have your professors taught the courses you have taken in college (lecture only, lecture with PowerPoint, instructor led discussion, student lead discussion, etc…)?

21) Is the method of instruction you experience most in college different from the method of instruction you received in high school? Please explain:

22) Overall, how has your progress been evaluated by your instructors in college (essays, term papers, multiple choice exams, short answer exams, oral exams, in-class assignments, etc…)?

23) How do you feel the instruction you have been given thus far in your college career can be used in real life situations?

24) Can you identify any aspects (classes, homework, exams, projects, etc…) of the curriculum you've experience thus far in college that have helped improve your critical thinking ability?

25) If you have dropped, or considered dropping a course during your college career, what prompted such action or thought?

26) What frustrated you the most about the Ennis-Weir Critical Thinking Essay Test?

27) How has your college education thus far prepared you to complete the Ennis-Weir Test of Critical Thinking?

28) Any additional comments?

Appendix E
Ennis-Weir Test Scoring Sheet

ENNIS-WEIR CRITICAL THINKING ESSAY TEST

Student's Name _____ Total Score _____ Graded By _____

CRITERIA AND SCORING SHEET FOR THE ENNIS-WEIR

Robert H. Ennis and Eric Weir

	Credit Given (maximum is 3 points per line except #9)
See manual for interpretation and qualification of these criteria.	
1. Recognition of misuse of analogy, and/or recognition of shift in meaning, and/or claim that incorrect definition has been stipulated.	
2. Recognition of irrelevance.	
3. Recognition that Paragraph Three is OK. (Neglecting the busy-streets limitation is not penalized here.)[A]	
4. Recognition of circularity, and/or recognition that no reason is offered. (Subtract one point from credit for interpreting "undesirable" as "not desired.")	
5. Recognition that there may be other ways of preventing accidents, and/or recognition that other things might be more desirable, and/or recognition that there probably isn't much traffic at that time, and/or recognition that other types of accidents are unaffected, and/or recognition that no evidence has been given that such accidents occur. (Other possibilities)	
6. Recognition of lack of controls, and/or inadequate sampling, and/or "only one case," and/or "post hoc fallacy." (Other possible explanation)	
7. Recognition of winning argument by definition, and/or recognition that a word has been made useless for empirical assertion, and/or claim that an incorrect definition has been asserted.	
8. Recognition that Paragraph Eight is OK. (Neglecting the busy-streets limitation is not penalized here.)[A] [C]	
9. One point for just condemning the overall argument; another point for reviewing or summarizing the responses to the other paragraphs in some reasonable way; two points for recognizing (anywhere) the error of concluding about all streets on the basis of reasons that relate only to busy streets;[A] and one point for noting (anywhere) that Raywift has attempted to push people around with his emotive language. Total possible: 5 points.	

A score of –1, 0, 1, 2, or 3 will be given for each of the first eight numbered paragraphs:[B]

–1 judges incorrectly (good or bad)[C]
–1 shows bad judgment in justifying
0 makes no response[D]
+1 judges correctly (good or bad), but does not justify[C]
+2 justifies semi-adequately
+3 justifies adequately

For Paragraph Nine, the range is –1 to +5.

[A]Do not penalize for failure to note busy-streets limitation in Paragraphs Three or Eight. If it is not noted at least somewhere, do not give the allotted 2 points in Paragraph Nine. If the limitation is noted in Paragraphs Three or Eight, credit should be granted at Paragraph Nine.

[B]These criteria are guidelines. The grader should use judgment in awarding points, subtracting for unspecified errors and adding for unspecified insights.

[C]Sometimes, something judged one way here will be judged another way by the test taker, and so well defended that a positive score (sometimes even +3) is warranted. The grader must use judgment. For example, a good argument could be mounted against Paragraph Eight.

[D]If the examinee makes a response, but the argument of the paragraph is not judged either good or bad and no reasons are given, count it as "no response."

Appendix F
Low-Inference Observation Rubric

Low-Inference Observations
Class: _____ Time: _____

Time	What Students Say or Do	What Teachers Say or Do	Texts Used

Vitae

Michael Robert Hepner is a native of Bishop Hill, Illinois and a resident of Dubuque, Iowa. As a child, he attended elementary and middle school in Galva, Illinois, and graduated from Galva Junior-Senior High School in 1996. Following high school graduation, Michael enrolled at Southern Illinois University as an undecided undergraduate. He bounced between zoology, biochemistry, history, science education, classics, engineering, pre-medicine, and geology before graduating with a bachelor's degree in English with a minor in classical history in 2004.

Michael earned his M.S. in criminology in 2007 from Indiana State University and conducted research under the direction of David Polizzi, PhD on life-course persistent antisocial behavior of confined offenders exposed to prenatal maternal tobacco use. Michael furthered his education by enrolling in the doctor of education program at Lindenwood University in 2010 where his main research interests were in the fields of higher education administration and andragogy.