BECOMING CRITICAL THINKERS: THE IMPACT OF TREATMENTS ON STUDENT REFLECTIVE PRACTICE IN THE COLLEGE CLASSROOM

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A Dissertation

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The purpose of the study was to determine the effect of instructional treatments on reflective practice and critical thinking in the college classroom at Bowling Green State University in the College of Business. The study employed a quasi-experimental pretest posttest control group design to examine student reflective practice among three treatment groups (T1-students receiving feedback only; T2-students viewing PowerPoint and receiving handout only, T3-students receiving feedback, viewing PowerPoint, and receiving handout) and one control group, which did not receive any instruction or feedback on reflective practice. The pretest and posttest were used to evaluate reflective practice and critical thinking skills among freshmen students (n=253). The study sought to identify the level of reflective practice for incoming freshmen, examine which treatment was most effective in increasing overall reflective practice growth, and which specific thinking skills were most effected by which treatments. Analysis of variance (ANOVA) was conducted to examine group differences in reflective practice growth.

The results indicate that the majority of participants were categorized in beginner status for 5 of the 7 categories presented. Deep thinking, analysis, and synthesis were noted as the categories of thinking skills with the greatest proportion in beginner status and ultimately require the most attention and improvement. The results indicate that freshmen students enter college with low level thinking skills.

Research question 2 examined group differences in Growth scores of Reflective Practice. Overall reflective scores were calculated as the sum of all thinking skill category scores. ANOVA results revealed significant treatment group differences in overall Reflective Practice.
growth, with Treatment Group 3 (PowerPoint, handout, and feedback) outperforming all other groups.

ANOVA was also used to examine the effect of instructional differences on each thinking skill category growth score. Treatment Group 3 (PowerPoint, handout and feedback) reported the most growth in all thinking skill categories, while the Control, which had no instruction or feedback, experienced the least growth in all categories. ANOVA results indicate significant group differences for all thinking skill categories; however, effect sizes reveal that the instruction treatments had the greatest impact on deep thinking and synthesis. Although results indicated that feedback alone did not have the greatest impact on reflective practice, it certainly was a necessary component of Treatment 3, the combined instructional strategy. In addition, the feedback-only group (T2) saw more growth in Overall Reflective Practice than T1, the handout/PowerPoint group, indicating feedback is critical to learning.

Based upon the results, the research concluded that: 1) the majority of college freshman have low levels of reflective practice; 2) A variety of instructional methods are needed to improve student thinking skill growth; 3) Feedback is a critical component in developing reflective practice.
DEDICATION

I dedicate this dissertation to my husband, Tim and my beautiful girls, Madeline and Brynn. Tim, you selflessly encouraged me to persist through this journey and supported me through many other life challenges. Thank you, Tim, for your endless devotion to me and attentiveness to our family. I am forever indebted. Madeline and Brynn, thank you for believing in me and praying for me. Your optimism was inspiring and your love never faltered, even when you had to sacrifice. Remember who you are, what you are capable of and know you are loved.

Dr. Mama
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CHAPTER I: INTRODUCTION

Background of the Problem

If we teach today’s students as we taught yesterday’s, we rob them of tomorrow.

John Dewey

Business and industry have long-standing complaints about graduating students’ “career readiness.” Levine (2005) stated “we are witnessing a pandemic of what I call ‘work life unreadiness.’…I [have] heard repeatedly from employers that their current crop of novice employees appear unable to delay gratification and think long term” (p. B11). He noted that recent graduates have difficulty making up their minds and are unprepared to choose an appropriate form of work. Employers have also stated that college graduates’ skills are not at the level needed to perform tasks required in the business world (Schoeff, 2007). A poll of business leaders revealed a need for more emphasis by higher education on cross-disciplinary knowledge and analytical skills (Banerji, 2007).

Employers are raising concerns related to the preparedness of students graduating from colleges and universities (Hart, 2006). According to Hart, 63% of business executives indicate that too many recent college graduates do not have the skills to be successful in today’s global economy. A key area of concern relates to business students being prepared for assuming leadership roles in the workplace.

In addition to business leaders, educators have expressed concerns about learning outcomes among graduates. In a comprehensive study performed by Amiran (1989), college students were tested on the subject of reflective thinking and meta-cognition. The four conclusions from the study were as follows: 1) Reading – Students could identify main points and supporting evidence; however, showed minimal growth in identifying implications or
articulating author’s assumptions. They showed no relationship between the article and their own lives and society. 2) Reflective thinking – Few students were skilled at reflective thinking. They lacked problem-solving and reasoning skills and were weak in making assumptions that have to be made in problem-solving. 3) Scientific reasoning – Students know little about scientific reasoning, methodology, and the importance of establishing a control for cause-effect relationships, or researcher bias. 4) Historical reasoning – Students were unable to effectively establish a chronology of events and did not see causal relationships between or among events (Amiran, 1989). Fink (2003) data suggests that higher education is currently turning out graduates who neither have a good general knowledge nor know how to engage in the kind of complex thinking and reasoning that society today needs.

Wagner (2010) surmised that the global achievement gap is due to schools teaching to tests and using No teaching methods opposed to teaching students skills that prepare them to make a contribution to the community, for their careers, and college. No teaching methods include rote memorization, which he thinks leads to boredom among students. The lack of engagement, therefore, creates the lack of skills in the student population. To close the gap, Wagner suggested educators “reinvent” the teaching profession and lessen or eliminate test prep. He outlined the ideal goal which is to focus on critical thinking and other survival skills in addition to assessment. He affirmed it is critically important to the future of educational practice to understand how students are able to be influenced by alternative teaching practices (Wagner, 2010). According to Wagner, educators must teach students to think, communicate effectively, stimulate curiosity and imagination, and develop contributing citizens to improve. He asserted that a country that continues to innovate will be more competitive and successful that others in the 21st century (2010).
Curriculum design that incorporates skills for workplace readiness may include interdisciplinary and integrated classroom projects. As indicated by Wagner (2010), projects that build skills in critical thinking and problem solving, collaboration, initiative, effective oral and written communication, accessing and analyzing information, and curiosity and imagination are the most effective.

One way students learn to master skills is through the practice of reflection. Educators use reflective practice to evaluate how students perceive their own abilities (Brookfield, 1986). *Transformative Learning* or *Reflective Discourse* are terms that stem from Transformative Learning Theory, which describes a learning process of “becoming critically aware of one's own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation” (Mezinow, 1999). Unfortunately, implementing instructional methods that facilitate reflective practice among college students continues to be a challenge for universities.

**Rationale**

Educators, through appropriate instructional methods, can play a key role in the learning process. However, classroom questioning is not just the responsibility of the educator. Socrates demanded that his students be able to formulate answers to questions and ask questions of themselves (Daudelin, 1996), making theories of reflection a long-standing concept used to engage learning.

Reflective practice, when used as both instructional method and a model for developing skills to make sense of one’s own work, produces many benefits. The term most commonly used in formal educational settings is reflective practice and can be seen as both a structure to aid critical thinking and improve existing understanding and a method for promoting autonomous and deep learning through inquiry (Hinett, 2002). Karen Hinett (2002) asserted that reflection
helps raise our awareness of ourselves as learners and to see that we can direct and change our learning. Through reflection, students think about what they have learned, how well they have learned it, how what they learned fits together, and where they can go from here. Highly developed critical thinking skills and the ability to apply knowledge are skills thought to create students that are life-long learners and leaders among peers.

Systematic reflection is a high impact educational practice used to promote deep learning and critical thinking among students. Schön (1983) contended that meaning making is only one of the possible outcomes of systematic reflection. Reflective practice through the educational process allows students the opportunity to build skills to assist in thinking critically and develop deeper learning habits during and after graduation. The goal of reflective practice in the classroom is to co-construct knowledge and make connections through creating new learning habits each day in the classroom. Educators engage learners in the educational experience through a new understanding of knowledge built collectively, as opposed to No linear learning. Kolb (1985) described learning as a four-step process: watching, thinking, feeling, and doing. He noted that learning, as it has historically been understood, is included in a much larger context that requires consideration of what students know, who they are, what their values and behavior patterns are, and how they see themselves contributing to and participating in the world in which they live. Kolb’s (1984) approach to reflective and experiential learning and Dewey’s (1933) instructional methods are described in detail in this study. Both Kolb (1984) and Dewey (1933) believed that learning must be grounded in experience. Reflection is a tool to help learners by encouraging and fostering a deep learning approach (Phillips, 2001). Reflective practice is difficult to teach, difficult to encourage, and not a process that students and indeed staff are
entirely comfortable with (Phillips, 2001). Difficulty in implementation has created a gap in educative processes that facilitate reflection.

Many universities have used general education as a means to creating well-rounded thinkers among students. General education, while based on the philosophy of “the full and creative development of the whole person” (Crookston, 1973, p. 50), has not consistently adopted pedagogical approaches by which its holistic purposes could be accomplished; many professors still use rationalist teaching methods and discipline-based categories to sort out and communicate knowledge to students. According to NASPA’s report Learning Reconsidered: A Campus-Wide Focus on the Student Experience, the degree of disconnection between educational structures and processes is profound and has serious implications for both teaching processes and the structures institutions use to help students learn. The report continued to describe the need to transform education through integrated learning structures. Transformative education places the student’s reflective processes at the core of the learning experience and asks the students to evaluate both new information and the frames of reference through which the information acquires meaning (Mezinow & Associates, 1990). The NASPA study detailed a compelling need for research in the area of critical thinking and reflection for improved student learning.

More recently, experiential methods such as ‘21st Century teaching’ and ‘High Impact’ educational practices have been emphasized in universities to introduce reflection as a method to improve student learning (Kuh, 2008). Experiential learning is also a method Kuh (2008) is partial to. He used the method to advance the development of community partners allowing students the opportunity to gain “real world” experience. This study sought to apply concepts of “real world” feedback in the classroom as an instructional method for the advancement of
teaching and student learning and allows educators to evaluate student learning through reflective practice.

General assumption of the benefits of reflection are: an increased awareness by students of quality of their work, improved student learning outcomes, increased self efficacy about learning, the development of life-long learning skills, and empowerment and control over one’s own learning (National Panel, 2002). Fortunately, an unintended benefit is the positive effect on student behavior. Little research has been conducted on effective instructional methods that enhance reflection or reflective practice. Reflection provides a pathway for communication with instructor to meet learning goals; educators understand what students have learned through what they have documented in their reflection (National Panel, 2002). Reflective practice provides a clear indication of where students think they are in the learning process, which allows for teacher focus improvements in the process (National Panel, 2002).

This study put high impact teaching practices into operation through the use of reflective practice in the classroom. Students worked in groups on a project and were asked to reflect on their experiences. Through the process, students learned about themselves and listened to insight provided by other members of the group. Students learned from the insight of other team members and reflected on their own experiences, based on their life experiences and background which encourages a deeper level of learning. Reflection on group work allowed students to evaluate values and develop new ideas, concepts, and shift paradigms from previous understanding. The study examined how various teaching techniques impact reflective practice and encourage critical thinking. Previous research has identified “good practices” in undergraduate education as those that include student-faculty contact, active learning, prompt feedback, time on task, high expectations, respect for diverse learning styles, and cooperation
among students (Chickering, 1969). Some research on instructional methods that support student reflection has been conducted in the healthcare and educational fields. Reflection is the cornerstone of uniting theory and practice in health promotion because the building together of the past and the present determine future health promotion actions (Naidoo & Wills, 1998). Unfortunately, there are limited studies on instructional methods that facilitate reflection in business college curriculum. Study results will be used transform curriculum in the business college, therefore, enhancing student learning outcomes.

**Purpose of the Study**

The purpose of this quasi-experimental pretest posttest control group study was to examine student reflective practice among four groups:

- **Treatment 1** – PowerPoint tutorial and handout only, multimedia method of instruction
- **Treatment 2** – Feedback only, formative assessment
- **Treatment 3** – Feedback, PowerPoint tutorial, and handout, multimodal method of instruction
- **Treatment 4** – Control, No instruction/feedback on reflection

The pretest and posttest were used to evaluate reflective practice among all groups. Participants included 411 freshmen students enrolled in the College of Business Administration at Bowling Green State University. Treatments were implemented and data were collected during spring semester of 2011. Reflections were assessed using the Reflection Evaluation Rubric or RER.

**Research Questions**

1. What levels of thinking skills do freshmen business students demonstrate?
2. Do different instructional treatments affect students’ overall reflective practice?

3. Which thinking skills are most affected by the various instructional treatments?

**Theoretical Framework**

John Dewey (1859-1952), an American born philosopher, psychologist, and education reformer was influential in transforming education. Dewey’s model of thinking frames this study and how the researcher defined and approached reflective practice. The “epistemology of inquiry” as a tool for practical problem solving was developed by Dewey. He was the founder of the philosophy of pragmatism, which is an important part of American education because his philosophy emphasized questioning through deliberation. Turnbull (2012) explained Dewey’s ideas as distinct because they reveal a problem-based logical reconstruction of knowledge through inquiry. Inquiry is defined as any process that has the aim of augmenting knowledge, resolving doubt, or solving a problem. Dewey believed that inquiry should not be passive observation but rather a process to initiate action, to test hypotheses, and re-adapt to proceed (1933). His philosophical interests centered in “epistemology,” or the “theory of knowledge.” The expression “experimental logic” was the term Dewey preferred in defining this new found approach to learning.

Dewey often disputed No methods of education. He developed a new model focusing on introspective methodology and reflection—a model that mirrored nature by exploring synthesis between idealism and the experimental concepts that he was trying to effect. He determined that the key to naturalistic approach considered the complex interrelationships between organisms and environments (Dewey, 1933). In his argument, he stated “if knowledge comes from the impressions made upon us by natural objects, it is impossible to procure knowledge without the use of objects which impress the mind” (Dewey, 1938/1997, pp. 217–218).
Dewey re-imagined the role of the educator in the learning process, making them a partner to guide students to independently discover meaning within a subject area. Beliefs of the theory of knowledge begin with an adaptive human response to environmental conditions and an active and continual restructuring of these conditions (Dewey, 1933). Reflective thought was defined by Dewey (1933, p. 6) as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends”. Based on this notion, he developed five phases or aspects of thinking skills outlined in Chapter II of this document.

Brewer (2004) explained Dewey’s work as a model that rejects methods involving memorization and recitation and provides active and engaged experiences for learners. Dewey’s ideas went on to inform other influential experiential models, including Project-Based Learning (PBL) and Kolb’s model of experiential learning. Dewey described inquiry as reflective practice and critical thinking, making his theory the most suitable choice to align with the methods reflective practice employed in this study.

**Definition of Terms**

The following terms were used in this study.

*Constructivism* – theory of learning where the student is actively involved in constructing knowledge by connecting it to existing knowledge and prior experiences.

*Critical Reflection* – the process of analyzing, reconsidering, and questioning experiences within a broad context of issues (e.g., related to social justice, curriculum development, learning theories, politics, culture, or use of technology). Critical reflection is recognized when depth and breadth is added to meanings by asking questions about, and related meanings to, a spectrum of personal and professional issues.
Electronic Portfolio (e-portfolio) – document that is the same as a No portfolio, but artifacts are collected, stored, and managed electronically with computerized text, graphics, sound, and video (Lankes, 1995). Also referred to as digital portfolios, web-based portfolios, multimedia portfolios, e-folios, and telefolios.

Epistemology – is the branch of philosophy concerned with the nature and scope (limitations) of knowledge. It addresses questions such as: What is knowledge? How is knowledge acquired? To what extent is it possible for a given subject entity to be known?

Formative Assessment Instructional Methods – is a range of formal and information assessment procedures employed by instructors during the learning process in order to modify teaching and learning activities to improve student attainment.

Instructional Media – Reiser and Dempsey (2007) defined instructional media as: “the physical means via which instruction is presented to the learners” (p. 18). This includes textbooks, videos, computers, and having an instructor physically instructing a group in a classroom.

Instructional Methods – Reiser and Dempsey (2007) defined instructional methods as follows: “the elements included in instruction for the purpose of supporting the achievement of the learning objective” (p. 314). The instructional methods allow learners to draw upon cognitive processes of learning through assisting learners in “paying attention to relevant materials, mentally organizing it into a coherent representation, and mentally relating it to prior knowledge” (Mayer, 2001, as cited in Reiser & Dempsey, 2007, p. 314). Instructional methods include practice problems or exercises, negative or positive feedback, visuals, educational games, and simulations.

Lecture – a method of instructional presentation of information, concepts, or principles, generally used to present a large amount of information in a short period of time.
**Metacognition** – self-monitoring or self-control process of learning (Nanjappa & Grant, 2003).

**Multimedia Instructional Method** – multimedia courses often utilize differing formats. Multimedia instructional methods use computers to present, text, graphics, video, animation, and sound in an integrated way.

**Multimodal Instructional Method** – having more than one mode. Multimodal instructional methods take advantage of a myriad of methods in the classroom. Instructors are able to incorporate technology and encourage the use of multiple senses on behalf of the student. Educators often incorporate multimodal methods in their instruction to engage students and increase their interest in the assignment.

**Pragmatism** – is a philosophical tradition centered on the linking of practice and theory. It describes a process where theory is extracted from practice, and applied back to practice to form what is called intelligent practice.

**Reflection** – a process to “look back” on experiences as to learn from them. Reflection is a method for constructing knowledge about one’s self and about the world. In education, reflection is known as the process whereby the learner studying re-evaluates their learning, thus creating new insights. Dewey (1933) identifies reflection as the integration of theory and practice, the cyclic pattern of experience, and the conscious application of that learning experience.

**Reflection Evaluation Rubric (RER)** – a scoring rubric is a self-evaluative tool with set criteria and standards, linked to learning objectives. It is used to assess or communicate about feedback on student performance.

**Self Management and Self Monitoring** – self management of the context, including the social setting, resources, and actions. Self monitoring is the process whereby the learners monitor, evaluate, and regulate their cognitive learning strategies (Bolhuis, 1996; Garrison, 1997).
Self-Directed Learning – self-directed learning incorporates both self management and also self monitoring. Self-directed learners are responsible for their own learning process. Knowles (1975) defined self-directed learning as a process in which individuals take the initiative in diagnosing their learning needs, designing learning experiences, locating resources, and evaluating their learning.

Social Development Theory – social development theory argues that social interaction precedes development; consciousness and cognition is the end product of socialization and social behavior (Vygotsky, 1978).

Traditional Instruction Method – No educational method of transferring skills, facts, and standards, generally implemented through rote memorization and oral recitation without additional effort to understand the meaning.

Zone of Proximal Development (ZDP) – is the gap between independent problem solving and a student’s aptitude in performing tasks with guidance or group collaboration. Vygotsky (1978) believed learning occurred in the “zone.”

Delimitations and Limitations

This study is delimited to College of Business undergraduate students. The freshmen students were enrolled in a 1-hour course. Treatments included a combination of formative assessment, multimedia, and multimodal methods of instruction. The four treatment groups were defined as:

T1: PowerPoint tutorial and handout only
T2: Feedback only
T3: Feedback, PowerPoint tutorial, and handout
Control: No instruction/feedback on reflection
Creation of reflection is influenced by many variables, such as, past experiences, student perceptions, and professor instruction. Several aspects limited the generalizability of results. First, the student population of Bowling Green State University is rather homogeneous. The university is located in somewhat rural northwest Ohio. Of the nearly 18,000 students attending Bowling Green State University, approximately 85% of their hometowns are located within the state of Ohio. Therefore, generalizability of results are limited to similar institutional student demographics.

The study was limited to a one-semester snapshot of the treatments freshmen students experienced at Bowling Green State University in the College of Business. Treatments were implemented across multiple sections with different instructors which may have limited the standardization of treatment protocol. In addition, the quality of instruction may have varied and, consequently, impacted reflective practice. Finally, a non-random sample was studies through existing groups.

**Organization of the Remaining Chapters**

This study is organized as follows: Chapter I includes the background of the problem, rationale, purpose of the study, research questions, theoretical framework, definition of terms, delimitations and limitations, and organization of the remaining chapters of this study. Chapter II reviews the literature on theories of reflective practice, models for reflective practice, aspects of thinking skills, types of thinking skills, deep thinking skills, analysis, synthesis, self-awareness, specificity, characteristics of instructional methods that support reflective practice, experiential learning, problem or project-based learning, real-world application through the use of technology and multimedia, electronic portfolios, multimedia, student feedback and assessment, leadership and effective thinking skills, and the summary. Chapter III includes research design, participants,
treatments, instrumentation, data collection procedures, research questions, data collection procedures, research questions, data analysis procedures, and assumptions and limitations of this study. Chapter IV outlines presentation and analysis of collected data. Finally, Chapter V provides a detailed summary of findings, recommendations, and implications of practice on student learning.
CHAPTER II: LITERATURE REVIEW

"Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand."

Confucius around 450 BC

While there are many broad frameworks from educational theorists regarding reflective practice and the development of critical thinking skills, there is little practical application for reflection in the classroom (Cornford, 2002). The use of reflective practice in the college classroom is relatively new; therefore, published empirical research is limited. Emerging trends between the models described in the following pages of this document detail significant experiences to the learner, challenge learner values and beliefs, link learner’s previous experiences, and create new learner behaviors (Mezinow & Associates, 1990). This chapter sought to examine differing models for reflective practice, aspects of thinking skills, the development of higher cognitive processes, and methods of instruction that support reflective practice.

**Theories of Reflective Practice**

The Latin term *reflectere* means to bend back. As a mirror bends back light, learners and educators bend the metaphorical light of their experiences back into their thoughts (Reed & Koliba, 1995, section I, paras. 1&2). Reflection helps the individual to consider what the experiences were, how they were affected by the experiences, and what they have learned and will take with them into new experiences (Reed & Koliba, 1995, section I, paras. 1 & 2). Fink (2003) described reflection as one of three components of active learning. The holistic view of active learning first includes information and ideas accessed in-class, out-of-class, and online. Second, he detailed experiences as doing, observing, actual, or simulated as “rich learning experiences.” And finally, reflection on what one is learning and how one is learning, in groups
or alone. Each of the three modes of active learning illustrates learning activities in a complete unit (Fink, 2002). Fink imagined a course in which the instructor has two main goals: first, to learn all the important course content, and second, to learn how to think critically about the subject. The theorists that developed the models for reflective practice, detailed in the next section, attempted to integrate these two ideas into their models—each in a different way.

**Models for Reflective Practice**

Numerous models for effective reflective practice have been developed. In the book, *How We Think*, Dewey (1933) defined reflective thought as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (p. 118). He broke down the differing aspects of reflection into five categories. The states of thinking were outlined as follows:

1. Suggestions, in which the mind leaps forward to a possible solution.
2. An intellectualization of the difficulty or perplexity that has been felt (directly experienced) into a problem to be solved.
3. The use of one suggestion after another as a leading idea, or hypothesis, to initiate and guide observation and other operations in a collection of factual material.
4. The mental elaboration of the idea, or supposition as an idea or supposition (reasoning, in the sense in which reasoning is a part, not the whole, or inference).
5. Testing the hypothesis by overt or imaginative action. (Dewey, 1933, pp. 199–209)

Experiential learning theorist Dewey (1933) maintained that effective learning leads to behavioral change. Reflective practice is a subcomponent of experiential learning. Experience-based research indicates that learning is most effective when people become personally engaged in the learning process, and engagement is most likely to take place when there is a need to learn
Reflection is a key element in experiential learning and is the basis for Dewey’s model surmised in five main categories: (1) solution seeking, (2) intellectualization of experiences, (3) creating hypothesis, (4) idea supposition, and (5) hypothesis action through testing. These categories support the instrument, the Reflection Evaluation Rubric (RER), used to assess reflective practice.

Many theorists have contributed to an increased understanding of reflective practice. The first well-known theorist on inquiry was Socrates, who influenced other theorists such as Hegel (synthesis), who influenced Vygotsky (constructivism), who influenced Dewey (experiential learning), who influenced Kolb (reflective observation and active experimentation to concrete experiences) (Wink, 2005). Although this list is not all-inclusive, Wink (2005), detailed the list as a snapshot of the evolution of thoughts as it relates to reflection.

Vygotsky’s Social Development Theory was developed by Russian Psychologist Lev Vygotsky (1896–1934). Vygotsky lived during the Russian Revolution and was not widely known in the United States until 1962. One of Vygotsky’s foundational theories is constructivism. Constructivism has three major themes:

1. Cognitive development through social interaction is fundamental in this process.
   Vygotsky believed social interaction preceded development. He stated, “Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter-psychological) and then inside the child (intra-psychological)” (Vygotsky, 1978, pp.10).

2. People such as teachers, coaches, or older adults are known as More Knowledgeable Others or MKO. An MKO is an individual or thing (like computers) that is viewed as
having a higher ability level that the learner, with respect to a particular task, concept or process.

3. The Zone of Proximal Development or (ZPD) is the gap between independent problem solving and a student’s aptitude in performing tasks with guidance or group collaboration. Vygotsky believed learning occurred in the “zone.”

Reflective practice aligns with Vygotsky’s theory of constructivism as it focused on the connections between people and the socio-cultural context in which they act and interact in shared experiences (Crawford, 1996). One of the main objectives of reflection is to make connections between learning and one’s experiences. Vygotsky (1978) believed that the internalization of learning led to higher order thinking skills. Reflective practice is used to strengthen the level of learning, creating more meaning of knowledge. Reflection is a way of internalizing learning (Mezinow & Associates, 1990).

In 1956, Benjamin Bloom created his taxonomy for categorizing levels of thinking skills, resulting in a structure containing levels of competence. Within each level of competence, are the skills required to have considered to have mastered learning. The six competencies—knowledge, comprehension, application, analysis, synthesis, and evaluation—are now a part of the fabric of education. Bloom’s educational hierarchy categorized thinking into simple to complex levels and developed a range of higher order thinking skills. He believed that attainment of higher order thinking skills would allow for individuals to effectively function in our ever changing world. Although similar to Dewey, Bloom’s taxonomy classified levels of cognitive learning used in education to develop critical thinking skills.

Related models such as Kolb’s model differentiated learning into stages of reflection. Kolb (1984) simplified the model into four main categories:
1. Experiencing – These are activities from which a student may learn (readings, fieldwork, lab work, problem sets, observations, simulations/games).

2. Reflecting – The student thinks about the experience (what was seen, felt, thought about) and integrates the new experience with past experiences.

3. Generalizing – The student develops questions and theories and attaches meaning to the experience.

4. Applying – The student tests out new ideas, attitudes, and behaviors.

Kolb suggested learning is the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping experience and transforming it (Kolb, 1984). Kolb’s experiential learning model is further explored and evaluated later in this document.

Another theorist, Donald Schön, drew a distinction in the use of two categories of reflection: 1) reflection in action and 2) reflection on action. Schön explained the learner’s ability to reflect while doing something and also after the action has taken place. He sought to improve individual and organizational learning. Schön (1983) believed engaging in continuous learning was a defining characteristic of professional practice. The concept of thinking “in action” was a good skill for professionals to capture in a fast changing world, making Schön a very influential American thinker. Over time, he developed theory and practice for reflective professional learning in the 20th century. His research detailed the notion of the “learning society.” If all learning involves all of one’s life, in the sense of both time-span and diversity, and all of society, including its social and economic as well as its educational resources, then we must go even further than the necessary overhaul of “educational systems” until we reach the stage of a learning society (Faure et al., 1972: p. xxxiii). With unique ideas centering on reflection, Schön
remarked, “The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain” (Schön, 1983 p. 68). He reflects on the phenomenon before him, and on prior understanding (which are implicit in behavior), then carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation. Schön discussed reflection on action which is further explained later in this document.

Although Schön’s main focus was gaining the capacity to reflect, Biggs’ focus was more about using reflection as a means to improve instructional quality in teaching.

An Australian educational psychologist and novelist, Biggs (1999) discussed the SOLO taxonomy, which categorizes students’ learning by levels of increasing understanding. The five categories are as follows:

1. *Extended Abstract* – Student conceptualizes at a level extending beyond what has been dealt with in the actual teaching. Can generalize to a new area.
2. *Relational* – Indicates orchestration between facts and theory, action, and purpose. Understanding several components which are integrated conceptually. Can apply the concept to familiar problems.
3. *Multi-structural* – Indicates understanding of boundaries but not of systems. Understanding of several components but the understanding of each is discreet. Disorganized collection of ideas or concepts around an issue. Has not been able to relate the items in the list.
4. *Uni-structural* – Concrete, minimalistic understanding of an area. Focuses on one conceptual issue in a complex case.
5. *Pre-structural* – no understanding demonstrated.
Many theorists have developed learning models that outline the thinking skills they feel are most important to learning. Although each theorist, (Dewey, Bloom, Kolb, Schön, and Biggs) had a different approach to the thinking skills that are used to improve learning, the similarities among these approaches guided the thinking skills and aspects of reflection evaluated in this study. As described in this chapter, there is no one set method for a learning model. Carr (1988) acknowledged that while it is possible to teach critical thinking and its components as separate skills, they are developed and used best when learned in connection with content knowledge.

**Aspects of Thinking Skills**

One may think of reflective practice as a structure for learning. Learners construct their own meaning about situations drawing on both their cognitive skills (reasoning, knowledge) and meta-cognitive skills (intuition, self-awareness) (Hinett, 2002). When something new is experienced, the learner recollects prior knowledge and tries to make a connection into the existing cognitive or meta-cognitive network of ideas (like fitting pieces of a jigsaw puzzle) (Hinett, 2002). She further stated that whether a perfect fit is possible depends on the existing pieces of knowledge and the learner’s ability to let the piece float until connections can be made. The process of reflection provides a structure for these connections and enables us to distinguish between important cornerstones of learning, prominent features, and background sky in a way that forms a meaningful and perhaps unique picture (Hinett, 2002).

Claxton (1999) described reflection as developing, building on, and in some cases changing existing behavior and practice. To reflect, one uses meta-cognition or self monitoring or self-control process of learning (Nanjappa & Grant, 2003). Meta-cognition consists of three basic elements: development of a plan of action, maintaining or monitoring the plan, and continuously evaluating the plan. Meta-cognition (Donovan, Bransford, & Pellegrino, 1999), an
internal dialogue that individuals develop on their own, helps build the skills of predicting learning outcomes and monitoring comprehension. What is known about learning is that it is complex and students learn at differing levels. A large amount of research has been performed to better understand cognitive processes in the sciences; however, few have tied the science of learning mastery to the application of learning.

Over time, researchers and authors have identified many learning models for educational instructional practice. Contributions from such individuals are shaping change in educational environments today. Many authors have a great appreciation of experiential learning. According to neuroscientist Sousa (2006), students are not actually taught to think because children are born with the brain organizational structure that originates thinking. He contended that educators can assist students in organizing the content of their thinking to facilitate complex reasoning. For example, in a normal classroom, most information is retained in the first 5-12 minutes of the class. Retention of new materials is at the lowest point in the middle of the course and there is a significant increase in knowledge retention in the last 5 minutes of the course. Sousa (2006) noted the importance of a stimulating environment to create more connections in the brain. “The brain makes the most neural connections when it is actively involved in learning, therefore, learning should be multisensory and interactive” (Sousa, 2006). Other notions related to Sousa’s research include:

- Learning activities that involve emotion trigger the release of chemicals in the brain that strengthen memory, so learning must be made meaningful to each student.
- The human brain strives to create connections or patterns, so learning should build on prior knowledge.
• The brain’s hierarchy of tasks starts with physical survival, moves to emotional survival, and only then turns to thinking and learning; students must feel physically safe and emotionally secure before they can learn.

• The brain of today’s students are accustomed to rapidly changing environmental stimuli, therefore, short learning periods are more effective than long ones.

Sousa is a proponent of Bloom’s Taxonomy as a model to support the structure as it relates to the brain processing information to engage in learning.

Educators are now evaluating ways to harness a better understanding of the differences and incorporate the science of cognitive learning and classroom and other teaching into effective instructional methods. Cotton (1988) performed a study on children in grades 2-5 that examined classroom questioning to enhance higher order thinking skills and critical thinking. Cognitive questions varied, however “higher cognitive questions are defined as those which ask the student to mentally manipulate bits of information previously learned to create an answer or to support an answer with logically reasoned evidence” (Cotton, 1988). Cotton further stated that higher cognitive questions are also called open-ended, interpretive, evaluative, inquiry, inferential, and synthesis questions. The study was developed to investigate the effects of instructional process variables on achievement in reading. The five variables displayed significant differences between more and less effective educators with regard to student engagement, learning, and asking direct questions. Research concluded that 60% of the questions asked are lower cognitive questions, 20% are higher cognitive questions, and 20% are procedural. Although higher cognitive questions do not necessarily contribute to higher learning, they do promote improvement. Lower level cognitive questions are more effective when the learning outcome is memorization. A positive relationship is found between a greater frequency of questions and student achievement.
More effective results are found when lower and higher cognitive questions are utilized collectively. However, increasing the higher cognitive questions by 20% has a positive impact on student scores. Teaching students to draw inferences and providing practice time results in higher cognitive responses and learning gains. In older students, increasing higher cognitive questions by 50% also increases on-task behavior, length of response, the number of relevant contributions, improvements in student-to-student interactions, improved grammar, improved speculative thinking, and relevant questions posed by students.

**Types of Thinking Skills**

Effective inquiry-based learning uses many types of thinking skills. Based upon the models and theories of Dewey, Bloom, Kolb, Schön, and Biggs, five thinking skills have been identified that support reflective practice: deep thinking, analysis, synthesis, self-awareness, and specificity. Table 1 displays a comparison between the learning models and the thinking skills included in the models recognized as significant to theorists. When comparing models, themes emerge related to the importance of analysis and synthesis in the learning process. All models attached significance to reflection on action and/or critical thinking and the learners’ ability to contextualize knowledge through application which creates deeper learning.

The following sections present literature to help define these thinking skills and also discuss instructional methods that support such skills.
Table 1

Thinking Skills by Theorist

<table>
<thead>
<tr>
<th>THINKING SKILLS</th>
<th>Dewey</th>
<th>Bloom</th>
<th>Kolb</th>
<th>Schön</th>
<th>Biggs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deep thinking</strong> — critical thinking—reflection on action—applying contextualized—making meaning—extended abstract—comprehending and re-interpreting—increasing knowledge</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Analysis</strong> — generalizing—reflection in action—multi-structural</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Synthesis</strong> — processing—making connections—relational</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Self awareness</strong> — experiencing uni-structural—comprehension</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Specificity</strong> — acquiring facts, pre-structural—memorizing—knowledge</td>
<td>X</td>
<td>X</td>
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</tbody>
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**Deep thinking skills.** Deep thinking, or as it is often referred to as critical thinking, is one of the most significant issues in education today. “Perhaps most importantly in today’s information age, thinking skills are viewed as crucial for educated persons to cope with a rapidly changing world. Many educators believe that specific knowledge will not be as important to tomorrow’s workers and citizens as the ability to learn and make sense of new information” (Gough, 1991, p. 3). Although approaches to learning and instruction differ among educators, the notion is similar; most feel it is possible to alter teaching practices to increase students’ thinking capacity. Presseisen (1986) asserted that the basic premise is that students can learn to think better if schools teach them how to think. Adu-Febiri (2002) affirmed that thinking can be learned. Without reflection, learning ends “well short of the reorganization of thinking that ‘deep’ learning requires” (Ewell, 1997a, p. 9). Learning for recall, or for forging the new connections among the concepts that will actually be used in future high-challenge situations, instead requires considerable periods of “alpha-level” activity or “reflection” (Ewell, 1997a). Without deep thinking, the successful solution of a “presenting problem” is likely to end a given
learning encounter immediately, at a point well short of re-organization of thinking that “deep” learning requires (Seely, Brown, Collins, & Duguid, 1989). Deep thinking allows students to construct knowledge; instead of passively receiving the information, the student is given tasks meant to lead him/her to understanding and learning (Ewell, 1997b, p. 6).

During college, students need to be introduced to educational practices that develop deep thinking. Instructional practices that facilitate reflection can develop higher cognition, an educational outcome supporting intellectual and practical skills as a part of everyday life. In addition, students develop intellectual and practical skills; they have a more positive attitude toward literacy (Chickering, 1969).

Through deep thinking transfer of knowledge occurs. Students extend what they have learned in one context to a new context (Donovan et al., 1999, p. 6). Deep thinking relates to Dewey’s model as noted when the mind leaps forward to a possible solution. Educators today consider Dewey the originator of the concept of reflection; however, he was known to draw from ideas of early educators, such as Aristotle, Plato, and Confucius. Bloom believed deep learning occurs when students develop deep levels of understanding by manipulating information and ideas to produce original and creative solutions and products (Bloom, 1956). Biggs noted that students come into the learning system with predispositions that are learning-related, such as prior knowledge, abilities, values and expectations, and ways of learning. These learning-related characteristics are referred to as the student presage factors that have a direct impact on the ways students choose to process academic tasks (Biggs, 1999). His model described a deep approach to learning as indicated by intention to understand the material through the use of strategy, combining a variety of resources, such as discussion, reflection, relating parts to a whole, and applying knowledge in real-world situations (Biggs, 1999).
Research indicated a need for improvement in critical thinking skills to deepen learning. Authors Richard Arum and Josipa Roksa (2011) understood the need to assess student critical thinking skills. In the book, *Academically Adrift: Are Undergraduates Really Learning Anything Once They Get There?*, Arum and Roksa sought to evaluate student learning and specifically thinking skills in the first semester and then again at the end of the second year. The study analyzed more than 2,300 undergraduate students among 24 institutions. Results demonstrated that 45% of the students had no significant improvement with regard to a myriad of skills including critical thinking, complex reasoning, and writing. After 4 years, 36% showed no significant gains in higher order thinking skills.

Deep or critical thinking has been studied by a myriad of researchers. Below are some reflections regarding its definition:

- Deep thinking is an essential component in meta-cognitive processes (Crowl et al., 1997).
- Analysis, inference interpretation, explanation, and self-regulation require inquisitive, systematic, analytical, judicious, truth-seeking, open-minded, and confident dispositions toward critical-thinking processes (Facione, 1997).
- Goal-directed, reflective, and reasonable thinking, as in evaluating the evidence for an argument for which all the relevant information may not be available (Crowl et al., 1997; Facione, 1998; Lewis & Smith, 1993; Patrick, 1986).
- The disposition to provide evidence or reasoning in support of conclusions, request evidence or reasoning from others, and perceive the total situation and change one’s views based on the evidence (Cotton, 1988).
David Kolb believed that deep thinking that lead to deep learning (learning for real comprehension) comes from a sequence of experience, reflection, abstraction, and active testing (1985). Reflection is about re-evaluation of values and belief systems through a thorough look at a concept from multiple angles and diving deep into questioning action.

**Analysis.** Analysis is performed when the learner breaks down a concept into its parts. To do so, the learner must compare and contrast two or more concepts. As inquirers’ frame the problem of the situation, they determine the features to which they will attend, the order they will attempt to impose on the situation, and the directions in which they will try to change it. In this process, they identify both the ends to be sought and the means to be employed (Schön, 1983, p. 165).

Dewey (1933) suggested analysis as another method of deep thinking, through actively testing the hypothesis by overt or imaginative action. No methods of meta-cognition note that learners decide whether to harness a stimulus as an opportunity for learning. The learner determines whether the information makes meaning or creates patterns. This type of analysis is often referred to as “disposition.” The concept of disposition is prominent in the pedagogy of developing analysis and critical thinking, where it often proves as challenging to get students to actually use critical faculties as to acquire them in the first place (Facione, 1997). According to Adkins and Murphy (1993), critical analysis involves examining the components of a situation, identifying biases and assumptions, existing knowledge, and personal cognition, to then challenge assumption and imagine or explore alternatives.

**Synthesis.** Another type of thinking skill detailed in this study is the use of synthesis in reflection. Synthesis is recognized when the learner is able to formulate generalizations, integrate new understanding, and predict likely consequences of actions (Adkins & Murphy,
Dewey’s (1933) model proposed the use of one suggestion after another as a leading idea, or hypothesis, to initiate and guide observation and other operations in a collection of factual material. Synthesis integrates two or more concepts to form a new concept (Bloom, 1956) and is essential to learning and education to meet the demands of the workforce today. Atkins and Murphy (1993) contributed the understanding of learners’ awareness of uncomfortable thoughts that encourage critical analysis of feelings transforming knowledge into a new perspective. Synthesizing information uses higher order thinking skills which are often misinterpreted as procedural knowledge. While synthesis may be a prerequisite for higher order thinking, it actually is a type of knowledge—specifically, knowledge of rules and their application (Crowl et al., 1997).

Crowl (1997) further noted procedural knowledge as “information learning,” however the ability to apply a rule or procedure to a situation is the “application” of knowledge or deep thinking. Synthesis and analysis are examples of procedural knowledge rendered as higher order thinking. Synthesis, analysis, and deep thinking used collectively form new knowledge. Self-awareness takes the new knowledge and applies it against previous knowledge to make new meaning of information. Thorough evaluation, validation, and appropriation of knowledge, along with synthesis, are crucial to the development of a new perspective (Adkins & Murphy, 1993).

**Self-awareness.** Dewey detailed self-awareness as, “an intellectualization of the difficulty or perplexity that has been felt (directly experienced) into a problem to be solved.” Learners are able to recognize their strengths and weaknesses based on their experiences and are able to articulate their skills and abilities to others. Knowledge of one’s own strengths and weaknesses as a learner, and the ability to derive a workable tailored “learning strategy” for a
given situation, are key elements of functioning here-sustained by considerable body of experimental literature (Halpern & Associates, 1994). Honesty and self-awareness means that the learner is able to assess their own knowledge, skills, and values. Learners are able to see themselves as others see them, and through reflection gain an improved self-efficacy for learning. The new self-awareness will guide future development. Self-awareness or mindfulness is the insight into personal sensations, emotions, thoughts, and actions in specific situations (Adkins & Murphy, 1993). When the learner accepts and takes ownership of their responses and the thoughts of other involved and honestly examines how the situation has affected the individual and how the individual has affected the situation, the learner has become self-aware (Adkins & Murphy, 1993). According to Killion and Todnew (1991), reflection can be categorized into three main directions. First, reflection in action which requires one to look back at accomplishments and review actions, thoughts, and outcomes. The learner uses self-instruction, imagination, task strategies, self-observation, and experimentation to improve performance. Second, reflection in action when an individual carries out a task while in the reflection process. The learner uses self-evaluation, causal comparison, and satisfaction and adapts to improve performance. Third, reflection in action is when an individual reviews what has been accomplished and identifies constructive guidelines to follow to succeed in the given task in the future. In this case, learners strategically plan and set goals, thus recognizing an increase in self-efficacy and evaluate their next action.

**Specificity.** Reflection on action and reflection in action involve recalling specific details related to information presented (Schön, 1983). Specificity allows students to show evidence of learning and teaching effectiveness through documenting how something happened and documenting the learners’ feelings regarding the information. Students identify how they might
have conducted things differently and if they had more information what they might have
changed about the incident. Service learning is a good example of a learning environment that
encourages the use of specificity to increase knowledge. Dewey often used practical experiences
as a method for learning. Biggs (1999, p. 57) stated that “a reflection in a mirror is an exact
replica of what is in front of it; reflection in professional practice, however, gives back not what
is, but what might be, and improvement on the original.” Thinking must include access to “past
experience and a fund of relevant knowledge” explained Dewey (1933, p. 123). He further
suggested that to unravel confusion or generate a solution, it requires integration of character and
mind through infusion of intellectual subjects with “so-called ‘informational’ subjects”; students
use what they already know to attend to new knowledge (Dewey, 1933). Dewey (1933)
concluded that the mental elaboration of the idea, or supposition as an idea or supposition
(reasoning, in the sense in which reasoning is a part, not the whole, or inference), for this study,
is interpreted as the definition of specificity.

**Characteristics of Instructional Methods That Support Reflective Practice**

Reflective practice is a critical part of the learning process that does not automatically
occur. Reflection is a part of self-constructed knowledge used “to improve student learning by
providing a structure for students to reflect systematically over time of the learning process and
to develop the aptitudes, skills, and habits that come from critical reflection” (Zubizaretta,
2004, p. 60). Dewey (1933) identified correct “habits of reflection” as being open minded,
organized, systematic, non-impulsive, and persistent. He suggested “we do not learn from
experience...we learn from reflecting on experience” (Dewey, 1997, p. 78). Dewey (1933)
emphasized changes in knowledge and belief rest upon careful and extensive study, purposeful
widening of the area of observation, reasoning out the conclusions of alternative conceptions and “personal examination, scrutiny, and inquiry” (p. 8).

Many instructional methods have been identified to support reflective practice. Higher education has acknowledged a growing need to redefine education in a way that transforms learning in the classroom to meet the demands of the 21st century. In the 21st century classroom, students must learn to think critically. In this study, critical thinking is referred to as deep thinking. Deep thinking involves introspection, self-analysis, contemplation, and reflection. When students use reflection and critical thinking skills, they are able to come up with his/her own solutions/suggestions, bring new insights to the topic, and become able to relate what has been previously learning new contexts (Ewell, 1997b, p. 6).

New learning contexts are avenues for reflection through group discussion or written reflection allowing students to adopt a new approach to learning. Collaboration between peers provides varied opportunities for student to cultivate explanatory analysis as the formation of an argument or explanation which immediately lends itself to the opportunity to examine one’s own thought processes (Goodman, 1978). Ewell (1997a) noted the importance of flexible thinking when the student is able to adapt to new learning contexts and tasks by connecting, organizing, and working previous skills and knowledge into new structures. According to the National Research Council’s (1996) recommendation that education should be grounded in collaborative, inquiry-based activity, it would therefore be logical to turn group discourse for insights into learning in today’s classrooms. Classroom discussion through student reflection leads to construction of new understanding among students; in groups and introspectively, students have the ability to elaborate in ideas and engage in discourse which allows for new meaning making (NRC, 1996). And while educators would love for these sorts of sense-making discussions to be
commonplace in their classrooms, it is clear that these discussions are not likely to occur without support from the teacher and school curriculum (Johnson, Johnson, Holubec, & Roy, 1984).

A common element of 21st century skills is the use of reflective practice to improve learning outcomes. Instructional methods found in both 21st century skills and high impact teaching practices support reflection. Such learning practices address three main skills in 21st century learning: life and career skills, learning and innovation skills and information media, and technology skills. Each of the skills uses reflection as a technique to deepen learning. Students are still expected to master general education skills, such as reading, writing, math, science, and other subjects. The difference lies in the focus on alternative “21st century” skills including critical and creative thinking, collaboration and communication, and applied innovation.

Students use critical thinking techniques to examine their learning in the required skill areas. Students must gain the knowledge “to ask and answer important questions, to critically review what others say about a subject, to pose and solve problems to communicate and work with others in learning, and to create new knowledge and innovation that helps build a better world” (Trilling & Fadel, 2009, p. 49). Benefits of 21st century skills include creating a community of life-long learners. Students can apply their learning through improved problem-solving skills and use higher order thinking to increase proficiency to meet the demands of real-world scenarios.

“Action-learning” is another method that supports deep thinking. Edgar Dale developed an educational model that incorporated theory and related instructional design to the learning process. The Cone of Experience is relevant to this study, as it depicts both knowledge retention and learning outcomes among individuals. Dale (1946) theorized that learners retain more information by “doing” opposed to hearing, seeing, or observing. His experiential, active, learning by doing model led to the development of the Cone of Experience (Figure 1).
Dale (1946) was an early experiential and visual learning researcher. With regard to the cone, he stated,

“What we found to be true of direct and indirect, concrete and abstract experience, can be summarized in a pictorial device which we call the ‘Cone of Experience.’ A visual aid explaining the interrelationships of various types of audio-visual materials and their individual ‘positions’ in the learning process…. The cone device is a visual metaphor of learning, in which the various types of audio-visual materials are arranged in the
order of increasing abstractness as one proceeds from direct experience.” (Dale, 1946, p. 6)

Boyd and Fales (1983) suggested that reflection is “the process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self and results in a changed conceptual perspective” (p. 100). Educators have the opportunity to create learning experiences and allow students to reflect on their experiences while guiding and prompting along the way.

**Experiential Learning**

Learning through ‘reflection on doing’ defines experiential learning. Experiential learning is the process of making meaning from direct experience. In 1984, Kolb published the learning styles model. Although he had developed similar models in prior years, the publication was considered notable and was compared to pioneers from the 1900s in the field including Rogers, Jung, and Piaget. Kolb (2004) and others have defined learning style as a preference by which students learn and remember what they have learned. To better understand human learning behavior, an examination of Kolb’s four learning styles is required. Kolb’s theories are based on a four-stage learning cycle. Kolb focused on the cycle of experiential learning where concrete experiences create a basis for observation and reflection which produce abstract concepts that can be actively tested. Testing creates new experiences for the learner. Learners often cycle through all stages, i.e., experiencing, reflecting, thinking, and acting.

Kolb (1984) suggested that the quality of reflection is crucial in ensuring that the learner does progress in their learning. Kolb outlined the reflection process through the Experiential Learning Cycle noted in Figure 2. The cycle begins with students sharing their experiences, which is the “what?” and continues through the learning cycle with “so what?” and “now what?”
Kolb (1984) suggested that the most effective learning takes place when reflection and practice are combined. Theory behind reflection includes the research of Dewey and Kolb, who merged the use of reflective thinking with action and engagement for an improved understanding of classroom content.

Developing reflective practice skills through instructional methods encourages educators to review content (what), the process (how), and the premise (why) (Atkins & Murphy, 1993). The learning cycle process encourages active learning; while students are in the learning experience, they reflect on their experiences after an activity and generate the hypothesis for their experience (Plack & Santasier, 2004).

Eyler and Giles (1999) summarized responses to the “what,” “so what,” and “now what” questions that form a comprehensive and integrated discovery throughout the learning cycle of the student. Furthermore, fostering reflection is based on the four core elements of reflection referred to as the “four Cs” (Eyler & Giles, 1999). First, “continuous” reflection is a reflective process that is implemented and maintained continuously throughout the learning cycle. Second,
“connected” reflections display students’ ability to “synthesize their thought and actions.” Next, “challenged” learners display an ability to move past surface learning to a deeper level of critical thinking.

Carr (1988) acknowledged that while it is possible to teach critical thinking and its components as separate skills, they are developed and used best when learned in connection with content knowledge. Finally, “contextualized” reflection can be noted when course content, discussion topics, and experiences “correspond” in a meaningful way. Given a specific learning context, the student is able to use familiar patterns that are reorganized and extrapolated so that they become meaningful in a new situation (Ewell, 1997b, p. 6).

Experiential learning is an important component of teaching/learning experiences both in and out of the classroom. Co-curricular learning is a key element of experiential learning. Co-curricular learning opportunities come in many forms which include mentorship programs, leadership development, service learning projects, international student exchange, internships, service learning opportunities, and more. The experiences can be used to develop a co-curricular transcript. A co-curricular transcript is official documentation of a students’ involvement in campus activities used to enhance or accompany a resume. They contain information about a student’s involvement when enrolled in college. Co-curricular transcripts highlight experiential learning outside of the classroom through research, cultural awareness, honors, physical or social development, leadership, and involvement in the arts. Reflection or a reflective report is a required aspect of co-curricular learning experiences. The reflection is written and/or oral and describes the student’s learning experiences including personal reactions and difficulties. Reflection takes place during and after the activity ends to reinforce knowledge or content and promote personal growth.
A variety of instructional methods that facilitate reflective practice among college students have been identified by Kuh (2008) and termed high impact educational practices. High impact educational practices have been developed to promote learner growth. These practices improve students on multiple outcomes: critical thinking, moral reasoning, need for cognition, well-being, diversity values, leadership, literacy, and academic motivation (Kuh, 2008). A common element of high impact practices is the use of reflection and the application of many elements of experiential learning. According to (Kuh, 2008), high impact practices to facilitate systematic reflection include teaching practices tailored to the characteristics of the learner and are based on the goals and strategies of the university.

- First-year programs that include critical thinking, writing, research, collaborative learning, and intellectual and spiritual growth are noted in the high-impact educational practices.

- Common reading is one of the concepts utilizing integrative studies and participatory group learning, often combining themes, for example, reflection and technology or sustainability and service learning.

- Learning communities combine cohorts of students and integrated coursework. Students work closely with each other and the instructor to explore topics through alternative lenses, often translating classroom application into real-life experiences.

- Writing intensive courses encourages students to utilize effective reasoning skills and improve oral communication and literacy. Group or team projects develop problem-solving skills and encourage collaborative discussion.

- Collaborative assignments include writing, team projects, research, and reflection.
• Field-based service learning projects and internships allow students to apply their classroom knowledge in real-world settings and reflect in the classroom regarding their experiences. Internship is a form of experiential learning; the student is placed in a career setting with professional feedback on the work performed.

• Capstone courses are normally at the end of a student’s academic career. Capstone course projects apply all aspects of student learning throughout their college experience.

Research regarding high impact educational practices suggests an improvement in student retention rates and student engagement.

In an article authored by Pascarella and Terenzini (1991), college graduation rates were documented as an abysmal 50% for decades across the nation. The study indicated nearly one out of five, 4-year institutions graduates less than one-third of its first-time, full-time degree seeking students within 6 years (Dick & Carey, 2004). The numbers continue to plague colleges and universities, forcing review in the methods of teaching, learning, and student engagement among institutions of higher learning. Further support documenting the need for student engagement was developed in an exploratory study conducted to examine readers’ reactions to curricular and co-curricular learning as evidences in reflection. The study was performed by Ford (2009). Data was captured through interview transcription. The study was structured by interviews of three groups that included students, faculty, and employers. Three samples of reflection were viewed by each group and they were asked to respond. Responses indicated whether items were found to be considered significant, memorable, and valued. Further exploration of the value of curricular and co-curricular learning was initiated. Data analysis displayed emerging themes among the
groups. The study indicated each group scores revealed co-curricular experiences as being slightly more learning than curricular experiences.

Some limitations identified by the author included the subjects’ prior experience with reflective practice and the structure of the data collection was such that each subject viewed three separate examples of reflections causing comparison difficulty for participants. Limitations in the subjects’ understanding of curricular and co-curricular experiences were also documented. The data results were surprising, noting there should be equal importance on balancing academic initiatives with leadership opportunities to create well-rounded and balanced graduates. The exploratory nature of the study may have lent itself to errors in data collection and analysis.

Co-curricular learning experiences allow students to interact outside of the classroom. Learning through co-curricular experiences may occur through community activities such as service learning or community-based research. Regardless of the type of activity a student engages in, research on the topic indicates students are more engaged in the classroom if they can apply their skills outside of the classroom. In addition, students have indicated a deeper level of learning through documenting their experiences in reflection.

Co-curricular experiential learning helps engage students in meaningful service, an accomplishment that is underscored by the growing collection of research to support the importance of engagement for students (Astin & Sax, 1998; Eyler & Giles, 1999). Student retention and graduation rates have also been tied to such research. Institutions are being asked to reconsider learning in higher education, as addressed in studies performed by Keeling (2006, 2006). Kolb (1984) suggested that the most effective learning takes place when reflection and practice are combined.
Co-curricular learning assists in the development of cognitive competencies, such as critical and reflective thinking and effective reasoning skills that allow students to develop life skills and self-knowledge. Developing the aspects noted above prepares students to apply ideas and themes across the curriculum and co-curriculum. In essence, students take the knowledge from the classroom and apply it in their daily lives to make the most informed decisions with regard to career, emotional intelligence, personal health habits, engaging in responsible decision making, increased knowledge of self, and maintaining personal accountability. Understanding the effects of the integration of curricular and co-curricular learning is vital to student success.

**Problem or Project-Based Learning**

Another rising influential teaching strategy is problem or project-based learning or (PBL). Research indicates high schools using project-based learning (PBL) have more positive outcomes related to student learning in the areas of content knowledge, collaborative skills, engagement and motivation, reflection and critical thinking, and problem-solving skills. According to a study by Thomas (2000), he surmised five criteria defining problem-based learning: First, “projects are central, not peripheral to the curriculum”; second, “projects are focused on questions or problems that ‘drive’ students to encounter (and struggle with) the central concepts and principals of the discipline”; third, “projects involve students in a constructive investigation”; fourth, “projects are student-driven to some significant degree; and finally, “projects are realistic, not school-like” (pp. 3–4).

Experts in the Center for Teaching Excellence at the University of Cincinnati outlined PBL as a learning-centered pedagogy founded in theories of constructivism, social behaviors, and situated cognition. Complex tasks or problems are presented aligning with course objectives and students work together in groups to solve problems. Reflection is a technique used in the
problem-solving process. Situated cognition focuses on both the process and the context of learning, demonstrated through problem-based learning (Bridges, 1992). Bridges distinguished that situated cognition proponents maintain that learning is best accomplished through active, social, and authentic learning processes (Bridges, 1992).

Reflection is an instructional principle and critical element in project-based learning (Duffy & Jonassen, 1992). Duffy and Jonassen (1992) explained the importance of providing an opportunity for and supporting reflection on both the content learning and the learning process. Independent thinking is developed by utilizing self regulation through the reflection process. Educators should model reflective thinking throughout the learning process and support learners in reflecting on the strategies for learning as well as what was learned (Schön, 1983). Figure 3 outlines the PBL learning process. Reflection takes place during the “class reflection” section of the instructional method. At this stage, learners are reassessing or “looking back” at what they have learned. Learners apply their knowledge to the new context and form a new hypothesis. After students synthesize their learning, a new meaning regarding the information is formed. Students then create a new action plan and form decisions based on the new meaning of the information. The PBL instructional method facilitates a deeper level of learning for the student and an improvement in the application of knowledge. The PBL process can be presented in many ways. The image below details the instructor presenting a prompt in Step 1 and walks through the activity engaging students in “action” to begin to solve the problem (Oklo, C., Englert, C., Bouck, E., Heutsche, A., & Wang, H. (2011).
Compared to No methods, students in PBL classes performed better on assessments of content knowledge (Boaler, 1997), and also benefited from improved reflection, critical thinking, and problem-solving skills (Mergendoller, Maxwell, & Bellisimo, 2006). Educators also use strategies such as critical debate and debriefing post critical incidents, journal writing, portfolios, role playing, art and literature, case studies, and group projects. Such strategies are experiential and transformative according to Plack and Santasier (2004).

Previous research has shown that PBL students increased their use of critical-thinking skills including synthesizing, evaluating, predicting, and reflecting by 46% while high-ability students improved 76% (Barron, 1998). Fink (2003) explained that when using PBL methods, students must learn to make a preliminary analysis, gather information or data, assess the
relevance of the new information, propose a solution, and assess the quality of their tentative solution.

In 2007, a research study was performed to evaluate teacher mental models about teaching and learning after applying an alternative instructional method in their classrooms. Problem-based methods were applied, and educators were asked how PBL changed their mental models about teaching and learning. The study incorporated the use of a conceptual framework and NUD*IST software of a cohort of 3rd year teacher education students’ reflections on changes in their mental models following their experience in a problem-based learning (PBL) topic. Students were asked to document a 2,000 word reflective writing assignment. In their writing task, students were required to reflect upon their PBL experiences and to evaluate in what ways, and how effectively, the PBL approach to teaching and learning contributed to their professional development. In this study, conceptual framework of the principles of PBL incorporated theory-practice relationships, professional collaboration, critical thinking, self-directed learning, and knowledge. Results indicated evidence that students did report changing mental models in areas such as (a) the value of case studies for engaging with subject content, motivating learning, and connecting theory to practice; (b) self-reflection and peer collaboration for cognitive and professional growth; and (c) processes of inquiry for developing self-regulated learning practices (Askel-Williams, Lawson & Slee, 2009). The study displayed the effectiveness of developing a professional identity through the use of PBL in teacher education. A major premise underlying the research is that pre-service teachers need to develop good quality mental models about teaching and learning because those mental models will inform their intentions, plans, and actions in their prospective classrooms (Kerr, 1987).
A key component of PBL is the development of self-directed learning. Pioneers of PBL, Savery and Duffy (1995) stated the learning goals of PBL relate to self-directed learning, content knowledge, and problem solving. Through self-directed learning, students become sensitive to their learning needs and are able to seek resources appropriate to enhance their own learning.

Research indicated reflection and self-directed learning programs have an impact on student learning. Knowles (1975) suggested that self-directed learners take initiative in learning; therefore, they learn more and learn better than those who do not. When the student is active and responsive and engages in activities, they have what is referred to as participatory behavior and they are more apt to learn (Ewell, 1997b, p. 6). Evidence indicated self-directed learners learned more deeply and more permanently (Knowles, 1975).

Reflection and self-directed learning engages students in the learning process. However, students also require validation in the learning process. Canada (2002) deemed the use of reflection as an established practice and an effective tool. His observations indicated the use of reflection as assisting in enhancing students’ skills through revision and improved professor/student relationships.

**Real-World Application Through the Use of Technology and Multimedia**

Many digital pedagogical strategies that encourage reflective practice are being implemented to create optimal learning environments. E-portfolios with reflection and sources of multimedia are two examples of pedagogical strategies used to positively influence learning. E-portfolios were one of the first technologies to focus on reflective practice. Educators are also using sources of video and PowerPoint tutorials available via Web 2.0. McCormick (2002) noted the use of free Web 2.0 tools available to educators and students that allow them to be actively
involved in analyzing, synthesizing, and evaluating. He described future educators as having the ability to create, share, and organize text and media, permitting individuals to reflect, collaborate, and communicate in new ways with individual sustainable technologies (2010). Both the benefits of using technology and the extensive options available are immense. This study focuses on multimedia treatments used to increase reflection.

**Electronic portfolios.** An electronic portfolio is a collection of electronic evidence such as text, electronic files, images, multimedia, blog and reflection entries, and hyperlinks. E-portfolios record evidence of learning achievement. Electronic portfolios are accessed via the web and can be shared with varying audiences. This technology has had a significant impact on reflection so its use must be addressed, although the use of electronic portfolio was not applied in this study.

E-portfolio is a medium in 21st century teaching practices used to develop critical thinking skills, enhance learning over time, and improve technology skills. According to Barrett, e-portfolios show “reflection, evolution of thought, and professional development” (2002, p.12). In addition, students work pushes beyond the normal classroom experience. Through technology, students’ work is organized, searchable, and transportable. Through this process, educators and students realize the main value in developing an e-portfolio, that is, the ability to demonstrate growth over time (Barrett, 2000). The changes in technology have also allowed colleges to review curricula and re-think faculty evaluation, program assessment, certification of student work, and accreditation processes (Bateson, 2002).

Several researchers have begun to outline impacts of electronic portfolios as related to student learning and teacher education (Milman & Elizabeth, 1998). In a qualitative study performed by NSSE (National Survey of Student Engagement) between 2000 and 2002, higher-
than–predicted levels of engagement and graduation represented something meaningful beyond what students bring to college. The 20 institutions in the study performed at a level that is noted as better than expected with regard to a variety of factors. Of the over 20 groups selected for the study, 9 schools were private institutions and 11 were public schools. The group consisted of large research-intensive universities and others had a focus on undergraduate education. The number of enrolled students ranged from 700 to over 20,000. Aspects of diversity were included in the study, incorporating two historically black colleges and universities, two Hispanic-serving institutions, and two women’s colleges. Ranges in ability and academic preparation through standardized test scores were also noted. All colleges were expected to display educational policies and philosophy that enhance educational effectiveness. The primary purpose of the study was to uncover what different institutions do to promote student success. The study examined only 4-year institutions. Study results indicated support for reflection through the use of electronic portfolios to enhance student learning. One of the items noted in the enriching educational experiences section of the study was the use of electronic portfolio technology to discuss or complete assignments. The study also suggested that participation in groups and organizations such as internships and field experiences, community service or volunteer work, foreign language coursework and study abroad, independent study or self-designed majors, student engagement in co-curricular activities, and a culminating senior experience, are noted as meaningful experiences. In the light of differing cultural traditions and history, each college has developed their own effective method to achieve overall effectiveness. This, combined with a supportive campus environment, appears to be the recipe for student success.

Multimedia. Another way to enhance learning and reflection is through the use of multimedia. Multimedia instructional methods use computers to present, text, graphics, video,
animation, and tutorial. A PowerPoint tutorial can be created or educators can access them on the web. This study used a PowerPoint tutorial to engage students and enhance learning. In 2008, a report from Cisco Systems titled *Multimodal Learning Through Media: What the Research Says* was released. According to the report, adding visuals to verbal instruction can result in significant gains in basic or higher-order learning (Fadel, 2008). Complex reasoning is strengthened when stimulating multiple senses.

The Cisco Systems study noted a set of principles related to multimedia and modality based on the work of Mayer, Moreno, and other prominent researchers (Fadel, 2008).

1. *Multimedia Principle:* Retention is improved through words and pictures rather than through words alone.

2. *Spatial Contiguity Principle:* Students learn better when corresponding words and pictures are presented near each other rather than far from each other on the page or screen.

3. *Temporal Contiguity Principle:* Students learn better when corresponding words and pictures are presented simultaneously rather than successively.

4. *Coherence Principle:* Students learn better when extraneous words, pictures, and sounds are excluded rather than included.

5. *Modality Principle:* Students learn better from animation and narration than from animation and on-screen text.

6. *Redundancy Principle:* Students learn better when information is not represented in more than one modality—redundancy interferes with learning.

7. a. *Individual Differences Principle:* Design effects are higher for low-knowledge learners than for high-knowledge learners.
b. Individual Differences Principle: Design effects are higher for high-spatial learners rather than for low-spatial learners.

8. Direct Manipulation Principle: As the complexity of the materials increase, the impact of direct manipulation of the learning materials (animation, pacing) on transfer also increases.

The study provided clear evidence of the positive impact of the use of multimedia in the classroom; however, it cautioned on evolving research with many variables that may weigh heavily on learning outcomes (Cisco, 2008).

Skiba (2005) proposed that faculty must adapt and modify their teaching strategies to recognize and address student preferences relating to digital literacy, experiential learning and collaborative interactions. Research by Hawkes and Rosmiszowski (2001) showed that discourse achieved a higher overall reflective intensity than reflections generated by teachers in face-to-face interactions did, recognizing the importance of time independence for providing a better opportunity to ask reflective questions.

**Student Feedback and Assessment**

Student feedback is a key component of the learning process and ultimately encourages educational success (Kuh, 2008). Feedback has been shown to be one of the most significant activities an educator can engage in to improve student achievement (Hattie, 2009). For purposes of this study, feedback on reflective practice through use of a rubric was initiated to promote deeper learning. Strong linkages between student response and constructive educator comment improves student learning (Hattie, 2009). When feedback is corrective in nature, that is, it explains where and why students have made errors, significant increases in student learning occur (Lysakowski & Walberg, 1981). Feedback must also be timely to be effective.
Feedback must be provided when the opportunity for learning is optimal. Delay in providing students feedback diminishes its value for learning (Banger-Drowsn, Kulik, Kulik, & Morgan, 1991). Rubrics provide students with helpful criteria for success, making desired learning outcomes clearer to them. Criterion-referenced feedback provides the right kind of guidance for improving student understanding (Crooks, 1998). Feedback allows for improvements in what is referred to as knowledge transfer. In backward-reaching transfer, the student reflects and makes connections to prior knowledge; in forward-reaching transfer, the student makes connections to how the information will be used in the future (Woolfolk, 1998, p. 320).

Author L. Dee Fink asked educators to review alternative methods for instruction in the book, *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses* (2003). Fink proposed an integrated model for achieving significant learning that may effectively apply to considering course syllabi (see Figure 4). Fink identified three critical elements (along with situational factors) that interact to contribute to student learning: identifying clear student learning outcomes, establishing feedback and assessment processes tied directly to these outcomes, and implementing active and innovative learning and teaching activities geared toward achieving the learning outcomes. Both students and their future employers benefit from the students’ greater ability to apply knowledge from their coursework to their job, and will carry the newfound method of learning throughout their lifetime as lifelong learners (Fink, 2003). Fink proposed an integrated model for achieving significant learning that may effectively apply to student activities.
Traditional instructional practice suggests instruction methods including lecturing has limited effectiveness in helping students retain information after a course is over, develop an ability to transfer knowledge to situations, develop skill in thinking or problem-solving, and achieve affective outcomes, such as motivation for additional learning or a change in attitude (Fink, 2003). Fink’s course design model is an integrated approach for significant learning experiences that encourage reflection and feedback for improved learning among students.

A research study developed by Quinton and Smallbone (2010) analyzed the use of feedback to promote student reflection and learning. The study outlined the need for students to gain the ability to self-reflect in order to effectively transition from student to worker. The study used a reflection framework adapted from Gibbs (1988). The exercise was applied on second- and third-year students and prompted them to reflect in a systematic and structured way about the feedback they had received for coursework assignments (Cottrell, 2003). Undergraduate students received their assignments back in a seminar with a blank reflection sheet. A copy of this sheet and an explanation of its purpose were also presented in the course documentation. The sheet consisted of two pages of carbon-imprinted paper with three questions. The first question, what do I feel about this feedback?, enabled students to focus on the
emotional response to the feedback and its attendant mark, so that the student could document how they felt upon receiving their feedback (Quinton & Smallbone, 2010). The second question, *what do I think about this feedback?*, encouraged the students to be analytical about the feedback. The third question, *based on this feedback what actions could I take to improve my work for another assignment?*, combined the two final aspects of Gibbs’ framework, “conclusion” and “action plan,” with key characteristics of reflective practice, such as the “aim to improve practice in the future,” “aim of self-development,” and “better understanding” (Moon, 1999; Quinton & Smallbone, 2010). Students were encouraged to read the feedback they had received, reflect on it, and fill in the self-copying sheet. Findings indicated student responses to the first question illustrated the students’ ability to vent their emotions prior to reviewing feedback. Responses detailed they were “relieved and happy” to reflect on their personal involvement and record readiness for reflection. The second question detailed responses as “constructive and useful.” Study results indicated an ability to distance themselves from their work and reflect on the feedback provided. The third question solicited broader responses, such as “better explanations and more evidence provided.” This response indicated students are able to identify development needs through the use of feedback sheets (Dochy, Segers & Sluijsman, 1999).

Researchers are realizing the right kind of feedback can make a significant difference in academic achievement among students. In 2010, The Higher Education Academy Engineering Subject Centre published a study regarding pre-feedback to improve student self reflection, learning outcomes, and engagement. The authors (Gardner & Willey, 2010) hypothesized an increase in student engagement if they provided guiding “feedback catalyst questions” to initiate reflection and facilitate effective feedback on learning outcomes. Prompts were provided to
students to respond to catalyst questions and then share responses with their group during in-class discussion. Behavior improved as related to the report requirements and the performance effect on the group. Students determined “feedback catalyst questions” provided more meaningful conversations among group members, assisted in exploration of improvements in team processes, and created more productive learning environments (Gardner & Willey, 2010). Tutors in the study also experienced improvements in the learning process. Tutor surveys indicated the “feedback catalyst questions” facilitated students’ thinking about their behaviors and allowed them to prepare for proper reflection. Tutors agreed that the questions developed exploration techniques and felt better prepared to assist students and more productive during the sessions. Overall, results indicated pre-feedback self-reflection exercises improved learning outcomes and student engagement with more than 80% of students reporting multiple benefits. Facilitation efforts were also eased. The authors anticipated increasing student reflection and confidence among students in their ability to judge and assess their own work (Gardner & Willey, 2010).

Educators use reflection as a means of formative assessment to provide documentation as the achievement of learning outcomes. The basis of the assessment is the reflection of student work or learning in co-curricular activities. The change from instruction-centered to learner-centered teaching in combination with co-curricular experiences will provide students a formula for success on the journey to discovering a deeper level of learning. Engaged learning is when the student is able to apply a learning strategy for a given learning situation (Ewell, 1997b, p. 6).

Rubrics are a self-assessment tool for learners and can also be used as a guide for educators to transition from instructor-centered to learner-centered teaching practices (Kuh, 2008). Rubrics are used to identify levels of learning and suggest specific components educators
re-evaluate for improvement. Incremental changes may also be used to transform teaching practices. Reflective practice is often challenging; it is developing self-awareness about an individual’s performance and regarding both the level of performance and the impact performance has had on their learning (Ewell, 1997a).

Deficiencies in literature point to assessment measures and rubrics to better critique student learning and development. This study has significant implications for improved practice through utilization of a reflective evaluation rubric (RER), detailed later in this document.

**Leadership and Effective Thinking Skills**

Leaders are constantly challenged by their ever changing environment. “Leadership,” Dwight D. Eisenhower said, “is the ability to decide what is to be done, and then to get others to want to do it” (Bass, 1990, p. 14). The development of critical thinking skills is important for effective leadership. Interestingly, a large number of textbooks address argument analysis and evaluation in terms of two independent factors—the acceptability of premises and their sufficiency to support inference of the conclusion—but they do not consider how those criteria could possibly be used to adjudicate between conflicting arguments (e.g., Freeman, 1993; Govier, 1997; Johnson & Blair, 1994; Thomas, 1997). Effective adjudication cannot be accomplished by a series of separate choices that decides between each claim in turn and its negation (Everitt & Fisher, 1995, p. 173). Critical and strategic thinking skills are complex. Problems cannot be resolved by reviewing one solution at a time; one must review the entire scope of the problem prior to creating a foundation for argument.

Thinking and dialogue share a developmental history as well as a functional similarity. A variety of developmental psychologists (e.g., Vygotsky) have proposed that thinking first develops in each individual as internalized speech, and that people learn to reflect on and
evaluate their own thoughts by responding to the comments of others (Rieke & Sillars, 1997).

Both decision making and employee influence are affected by good or bad leadership. In participative leadership, for example, decision making and employee influence merge (Yukl, 1998, p. 122). A leader may invite subordinates to contribute to the decision-making process in order to both improve decision quality and increase subordinates’ commitment to the outcome (Yukl, p. 122).

In 2009, a strategic thinking questionnaire (STQ) was developed to measures three thinking skills (systems thinking, reframing, and reflection) among students from four universities in the United States, Malaysia, Hong Kong, and Shanghai (Pisapia, 2006). Study participants were college students (future educators) preparing for school leadership roles. The study reported data from 328 educators from differing cultures and norms. Researchers hypothesized that skills may vary among educators due to culture differences. However, findings indicated that educational leaders’ use of strategic thinking skills were found in all locations but the variance was in their use, more a function of age of respondents, and gender rather than location. Most importantly, researchers uncovered that the ability to interpret and make meaning of discreet and seemingly unrelated events is a hallmark of today’s successful leader (Pisapia, 2006).

In 2006, Pisapia noted that leaders who find themselves in such messy, chaotic, complex environments fail because they are not trained in and rely upon a linear thinking mindset that does not work in situations characterized by ambiguity and complexity. He further stated that they are unable to identify critical societal and institutional forces influencing their environment and thus do not connect their organizations to the current major themes associated with success. Weick and Quinn (1999) noted that the change in the environment requires leaders who can add
strategic thinking capabilities to their repertoire of the more common analytical capabilities long taught in our management schools. Henry Mintzberg (1994) sees strategic thinking as a synthesizing process utilizing intuition and creativity whose outcome is “an integrated perspective of the enterprise” (p. 10). Strategic thinking is an all encompassing mental model that incorporates creativity, critical thinking, and analytical thinking, although accomplishing all types of thinking simultaneously is difficult, because of the requirement to suspend critical judgment (Pisapia, 2006).

According to Pisapia (2006), when applied correctly, strategic thinking enables the leader to (a) recognize interdependencies, interrelationships, and patterns, and (b) make consequential decisions using both powers of analysis and intuition. Leithwood and Steinbach (1992) believed that efforts to improve the effectiveness of education may be more productive if more consideration was given to improving the quality of thinking and problem-solving abilities of administrative and teachers rather than simply focusing on actions or behaviors. The philosophy relates to students as well.

**Summary**

To summarize the literature of this chapter, aspects of reflective practice and specifically theories, models, instructional methods, and thinking skills support student learning. Student reflection is noted as allowing students to review and evaluate their work to improve. In this chapter, many varied techniques were examined and have been shown to have a positive impact on student learning and reflection.

Several theorists such as Dewey (1933) and Kolb (1984) have developed models for reflection that provide a guide to improved learning through reflective practice. Thinking skills, such as deep thinking, analysis, synthesis, self awareness, and specificity, are used in reflection
to develop critical thinking skills. A qualitative study was performed by Phan (2008) regarding the unification of differing theories of learning. Main objectives included testing of conceptual models that encompassed student study strategies, effort, and reflective thinking. Participants included 298 (182 females and 116 males) university students. Questionnaires with Likert responses were used and data were analyzed with latent variables approaches (Phan, 2008). One-way MANOVA was used to analyze data. Results indicated achievement had no impact on academic performance; however, reflective practice directly and positively influenced performance. Goal mastery was directly influenced by deep processing and effort (Phan, 2008).

Researchers developed instructional methods to encourage reflective practice in an effort to improve learning. Many models have been developed regarding student learning. Models ranged from thinking skills, student experiences, and/or instructional methods. Each model described a different method to assist with the enhancement of student skills.

In a qualitative study in (2002), four student reflective journals and other artifacts were evaluated. Instructors provided feedback throughout the semester. Participants engaged in a 45-minute interview with semi-structured questions to explore their views on reflection. Interviews were audio-taped and transcribed in search of themes and consistencies among the cases. The study confirmed the value of journal writing and reflection. Researchers determined that the best type of reflection follows Valli’s typology which is a teaching tool or model for reflective writing from published authors (Spaulding & Wilson, 2002).

There have been a number of valuable studies regarding improvements in critical thinking skills through reflection and the use of electronic portfolio devices (Barrett, 2002), all of which presented evidence on the development of a number of skills. However, none of these
studies provided treatment effects of the impact of differing instructional methods as they relate to reflection. This study sought to fill a gap in the literature related to this topic.
CHAPTER III: METHODOLOGY

“There is no question of theory versus practice but rather of intelligent practice versus uninformed practice.” John Dewey

This chapter presents a summary of the design for methodology related to research questions to better understand the impact of treatments on student reflective practice in the college classroom. This chapter explains the research design, participants, process applied for data collection, instrumentation to be utilized in the study, data analysis, and several assumptions and limitations for review.

**Research Design**

This study used a quasi-experimental pretest posttest control group design to examine student reflective practice among three treatment groups (students receiving feedback only, students viewing PowerPoint only, and students receiving feedback and viewing PowerPoint) and one control group. The pretest and posttest were used to evaluate reflective practice. The study design was intended to reveal the degree to which each treatment influenced student learning through reflection or the dependent variable. Quasi-experimental research design was selected for this study to identify cause-effect relationships in the data. Since existing groups were used, experimental design was not possible. The thinking skills identified and defined in this study are adapted from Dewey and are used as a direct metric or measure for learning in the Reflection Evaluation Rubric (RER).

**Participants**

This study evaluated treatment effectiveness on students’ reflective practice among 411 freshmen students invited to participate in the study and enrolled in the College of Business Administration at Bowling Green State University. Bowling Green State University has
approximately 20,000 students currently enrolled. Students of color comprise 17% of total enrollment. Entering freshmen have a 22 average ACT and a 3.23 average high school GPA. The accessible population is male and female College of Business Administration students between the ages of 17 and 19 years, enrolled in all areas of study provided by the College of Business. The study sample included 411 freshmen students enrolled in a 1-hour credit business course during spring 2011 semester. Twelve sections of this course were offered during spring 2011. The course, BA1100 – Applied Business Experience 1, is a lab course that seeks to build on the previous semester BA1500 course. Students were exposed to hands-on learning experiences. Course learning outcomes relate to inquiry, communication, participation and leadership, personal and social responsibility, innovative thinking, and business knowledge. Students were expected to collect evidence to demonstrate their learning for their learning portfolio throughout the course. The course facilitates students to gain customer insight, product knowledge, and business insight while working in teams or groups.

All BA 1100 students were invited to participate in the study. This freshmen population of this study represents approximately 10% of the population accessible in the College of Business Administration at Bowling Green State University of the number of College of Business Administration freshmen enrolled in a 1-hour course. Of the 411 students, 302 students agreed to allow their data to be included for analysis.

Experts in the College of Business Administration and the Center for Teaching and Learning collectively agreed the treatments selected would provide the most impactful information for the study. The four groups were: Treatment 1) students viewed a PowerPoint tutorial and received the Reflection Handout only; Treatment 2) students received feedback only;
Treatment 3) students received feedback, viewed the PowerPoint tutorial, and received the Reflection Handout; and Group 4) the control. Student reflections were evaluated for all groups.

Treatments

High impact activities increase the odds that students will take more time and effort to learn, increase faculty interaction regarding important issues, have a more global perspective regarding diversity, and obtain more frequent feedback on their work (Kuh, 2008). Additionally, students will integrate learning through reflection, continue to relate learning to other experiences, and apply learning to real-world scenarios.

All 411 students were notified when introduced to the study that if at any time they choose not to participate they were able to opt out. All participant information was kept confidential. There was no way to identify or relate data to a particular participant. Treatments were randomly assigned to the 12 sections available. Table 2 details the four treatments groups applied across the 12 course sections. Three course sections were randomly assigned to each treatment group, such that each group was comprised of approximately 75 students.
Table 2

Course Sections Assigned to Treatment Groups

<table>
<thead>
<tr>
<th></th>
<th>Treatment Group 1: PowerPoint Tutorial and Handout Only</th>
<th>Treatment Group 2: Feedback Only</th>
<th>Treatment Group 3: Feedback, PowerPoint Tutorial, and Handout</th>
<th>Control Group: No Instruction /Feedback on Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001 M 9:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1002 W 9:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1003 F 9:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1004 M 10:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1005 W 10:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1006 F 10:30 am</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1007 Tu 8:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1008 Th 8:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1009 Tu 9:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1010 Th 9:30 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1011 Tu 11:00 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1012 Th 11:00 am</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All four groups utilized the same Reflection Prompts 1 and 2 (see Figures 5 and 6). The Reflection Prompts encouraged students to reflect on their experiences with regard to their personal contribution to the team while working on the team project for the course. The first prompt was initiated as a pretest to provide baseline data for the upcoming treatments. Students were asked to respond during the 1-hour class session the week of midterms, during the spring semester. At the end of the semester, 3 weeks later, Prompt 2 was applied encouraging students to think deeper about what they had learned during their group project and how it may relate to work experiences. Prompt 2, detailed in Figure 6, encouraged students to reflect on their experiences with regard to their personal learning throughout the team project exercise.
The purpose of this assignment is for you to reflect on your contributions to your BA 1100 team and your team’s project to date. Reflect on the positives and negatives, and be constructive with your comments.

Type your reflection in the memo format and address the following areas:
1. How you have contributed to your team’s efforts?
2. In what ways, if any, have you possibly detracted from your team’s efforts?
3. How can you change or improve your own actions to help your team work more effectively?

Figure 5. BA 1100 Team Reflection Memo 1.

The purpose of this assignment is for you to reflect on your BA 1100 team project. Type your reflection in memo format and address the following:
1. What have you learned from your team project?
2. What are you most proud of? Why?
3. What were the downsides of the team project?
4. What skills did you develop working on a team project and how can they apply to a job?

Figure 6. BA 1100 Team Reflection Memo 2.

Another commonality across all four groups was the instrument that was utilized to evaluate the reflection responses from all four groups were evaluated using the Reflection Evaluation Rubric (RER) (see Table 3). The rubric was developed to indicate or categorize the level of the reflection provided by students. Although the RER was used to evaluate all responses, only treatment groups 2 and 3 received a copy of the RER. The development and properties of the RER are discussed further in the Instrumentation section of this document. Although all of the four groups experienced several common elements such as the coursework, team exercises, and Reflection Prompts, the instruction and feedback provided in support of reflection is what differentiated the treatment groups. Table 4 details the procedural timeline for each group. In addition, the following sections describe the instructional experience for each group.
### Reflection Evaluation Rubric

<table>
<thead>
<tr>
<th>Categories</th>
<th>Expert</th>
<th>Intermediate</th>
<th>Beginning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Thinking</td>
<td>Your reflection shows evidence of considerable time and effort spent in thinking hard about what you learned, how you learned it, and how this learning experience connects with other experiences you have had and with your prior knowledge.</td>
<td>Your reflection demonstrates some effort in thinking about the experience, but you need to think more deeply, exploring different aspects of the event or experience. Ask yourself more questions and include your answers in the reflection. Dig a little deeper.</td>
<td>Your reflection has clichés and shows little effort and little awareness of your learning or the connections among ideas and prior experience. Push yourself harder to think about what happened and avoid writing words/phrases that you’ve heard hundreds of times (e.g., “I learned a lot from this experience.”)</td>
</tr>
<tr>
<td>Analysis</td>
<td>Your reflection shows substantial evidence of your ability to identify the component parts of an event or experience, compare and contrast them, and detect patterns and relations among them.</td>
<td>Your reflection shows some ability to identify and relate the component parts of an event or experience and some ability to detect patterns. Your reflection could be improved by greater attention to these elements.</td>
<td>Your reflection lacks analysis. Elements of the experience are perceived or described as isolated events and patterns are not identified. Pay more attention to how elements of the experience relate.</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Your reflection shows that you have the ability to create new ideas and generalizations based upon previous knowledge and experiences as well as the ability to relate knowledge from several areas and draw relevant conclusions.</td>
<td>Your reflection demonstrates that you made some effort at drawing conclusions and making generalizations, but your efforts are not completely successful. Parts of your reflection seem random and unrelated. Make a greater effort to detect and articulate connections.</td>
<td>Your reflection does not show evidence of synthesis. Ideas seem random and unrelated. You offer few conclusions or generalizations. Ask yourself how elements of this experience connect to each other, and to various aspects of your life.</td>
</tr>
<tr>
<td>Honesty and Self-Awareness</td>
<td>Your reflection shows considerable evidence that you are speaking of your experience in a genuine and honest manner. You have included a number of excellent and original insights. You openly examined your experience and engaged in honest self-appraisal.</td>
<td>Your reflection shows some evidence that you tried to examine your experience openly and honestly, and you have included some original content. You need to avoid generalizations and work toward more genuine insights.</td>
<td>You have little original content in your reflection. You may have included what you think others wanted to hear. What you really experienced is what is really important here, so that is what you should write about.</td>
</tr>
<tr>
<td>Specificity</td>
<td>Your reflection includes many relevant details and examples that demonstrate thought and learning.</td>
<td>Your reflection contains some good details and examples but could be improved by including more relevant details. What really happened?</td>
<td>Your reflection is vague, lacking in specifics, details, or examples. Add more specific details and examples.</td>
</tr>
<tr>
<td>Thoroughness</td>
<td>Your reflection encompasses all aspects of the event or experience and responds to any and all prompts provided by the instructor.</td>
<td>Your reflection covers some aspects of the event or experience but leaves out some significant elements. Some prompts provided by the instructor are addressed; others are omitted. Pay attention to all aspects of the experience and double check the assignment to be sure you have completed it.</td>
<td>Your reflection fails to encompass all aspects of the event or experience and/or omits important elements of the assignment. Pay attention to all aspects of the experience, from beginning to end.</td>
</tr>
<tr>
<td>Clarity and Correctness</td>
<td>Your reflection is carefully organized and can be easily followed by the reader. The writing is clear, the language is appropriate, and there are no mechanical or spelling errors.</td>
<td>Organization is evident in your reflection but not completely developed. Additional attention to organization, word choice, grammar, and/or spelling would improve this reflection.</td>
<td>Your reflection is not well organized, is unclear, uses slang or other inappropriate language, and/or has spelling or grammatical errors. An outline might help with organization. Check your work for errors.</td>
</tr>
</tbody>
</table>
The information below is based on the performance indicated in your reflection submittal. It displays “real-world” feedback from an employers’ perspective if you were a candidate being considered for a job opening. The feedback is intended for you to understand the relationship between your work in school and how you are currently building skills that can be used to improve work place performance. The feedback details your approach to work in general based on how you met the criteria established in the rubric developed for this exercise. Feedback on this form and the rubric are not indicative of the grade you will receive for the course, only to provide a perspective of the expectations of performance by future employers.

Table 4

**Treatment Timeline**

<table>
<thead>
<tr>
<th></th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
<th>Week 13</th>
<th>Week 14</th>
<th>Week 15</th>
<th>Finals</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Distribute Prompt 1</td>
<td>Collect Prompt 1</td>
<td></td>
<td>Distribute Handout, view PPT</td>
<td></td>
<td>Distribute Prompt 2</td>
<td>Collect Prompt 2</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>Distribute Prompt 1</td>
<td>Collect Prompt 1</td>
<td>Score Prompt 1 using RER</td>
<td>Score Prompt 1 using RER</td>
<td>Score Prompt 1 using RER</td>
<td>Score Prompt 1 using RER</td>
<td>Distribute RER Feedback and Prompt 2</td>
<td>Collect Prompt 2</td>
</tr>
<tr>
<td>T3</td>
<td>Distribute Prompt 1</td>
<td>Collect Prompt 1</td>
<td>Score Prompt 1 using RER</td>
<td>Score Prompt 1 using RER</td>
<td>Distribute Handout, view PPT</td>
<td>Score Prompt 1 using RER</td>
<td>Distribute RER Feedback and Prompt 2</td>
<td>Collect Prompt 2</td>
</tr>
<tr>
<td>Control</td>
<td>Distribute Prompt 1</td>
<td>Collect Prompt 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Distribute Prompt 2</td>
<td>Collect Prompt 2</td>
</tr>
</tbody>
</table>

**Treatment Group 1: PowerPoint Tutorial and Handout Only**

Treatment Group 1, composed of sections 1006, 1008, 1010, and 1012, viewed the PowerPoint tutorial and received the Reflection Handout only. The PowerPoint tutorial is detailed in Appendix A. The Reflection Handout was provided to students to assist in guiding the
reflection process (Figure 7). Students received the first Reflection Prompt week 9 of the course. Upon receipt of the Prompt, students wrote a reflection on their group experience. No feedback on the first reflection was distributed to the class, nor did they receive the RER document (although the handout and tutorial refer to the RER, its use was omitted from use in Group 1). Prior to completing the second reflection, students viewed the PowerPoint tutorial in class as a large group. Prior to viewing the PowerPoint tutorial, students received an introduction from the instructor:

You’ve already written one reflection, and you will write another later in the semester. We’ll score your first reflection [and give you feedback on how you did]. In order to better prepare you for your second reflection, we’ve got a short PowerPoint presentation we’d like you to watch about how to write good reflections and why they are important. After you watch the PowerPoint, I’ll give you a handout that contains much of the same material and a rubric that will give you an idea of the crucial elements of a reflection and various levels of performance. Any questions before we watch the PowerPoint?

The second Reflection Prompt was assigned to the class week 13 of the semester. The PowerPoint tutorial is a multimedia source that was used to enhance student learning through the use of technology techniques. The group did not receive feedback regarding the quality of reflection in response to the 1st Reflection Prompt.
Reflection about Learning in the College Classroom

Part I: What do we mean by reflection?

Think about the two most common meanings of the word.

One is to think, ponder, or meditate.

The other is an image cast back by a still surface like a pond or a solid surface like a mirror.

When we talk about reflection in the college classroom, we are incorporating both meanings.

Thinking:

We mean first of all that students should spend time in deep thought about their own learning. They should think about what they have learned, how they have learned it, and the connections that exist between prior knowledge and new knowledge, between information learned in different classes, and between learning inside and outside of class.

Seeing Yourself:

We also mean that students need to look at themselves critically as students. To look in the mirror to understand themselves as learners and to be critically aware of both what they already know and what they still need to know.

Part II: How Can Students Learn to Reflect?

One of the most important ways to learn about reflection is to understand the crucial elements of a good reflection.

• A good reflection shows evidence of serious thinking and questioning.
• A good reflection requires self-awareness and honesty.
• A good reflection is full of concrete and specific examples.
• A good reflection is thorough.
• A good reflection is well organized and correct in terms of grammar and mechanics.
• A good reflection shows the ability to synthesize—that is, to pull lots of different ideas together, and to show the relationships between concepts, prior and new knowledge, and classroom and co-curricular work.
• A good reflection shows the ability to analyze—that is, to break ideas down into their component parts and put them together again in new ways.

Your instructor will provide you with a rubric that will help you to prepare and evaluate written reflections.

Another important way to learn to reflect is to practice. Even if your instructors don’t specifically ask you to reflect on your learning, you should anyway. Every time you do a paper or major assignment, think about your own learning.

Always be aware of the possibility of connections between and among your classes. “What am I learning in sociology that relates to what I am learning in business?” “How will this course in literature help me to be a better manager someday?”

Your instructor may help you in the reflection process by giving you specific questions to answer about an assignment. If he or she does not, here are some good questions you can ask yourself:

• What exactly did I learn?
• How have I changed as a result of this experience?
• How did I go about making sense of the information/situation?
• What parts of the experience were the most/least valuable and why?
• How does what I learned relate to what I already knew about the concept?
• How does what I learned relate to my other classes?
• How does what I learned relate to my co-curricular activities?
• How does what I learned relate to me as a person?
• What specific skills have I practiced/perfected in completing this assignment?
• What specific skills do I need to develop to do an even better job next time?

What more do I need to learn about the subject/topic/concept? Another important aspect of learning to reflect is feedback from your instructors or peers. Other people can sometimes help you see your own learning or progress even if you don’t, so feedback is essential to writing better and better reflections.

Figure 7. Reflection Handout.
Experts in Bowling Green State University’s Center for Teaching and Learning assisted in the development of the PowerPoint tutorial, which presented key concepts in effective reflective practice and prompting ideas to flow. The PowerPoint tutorial was provided to aid students in grasping “how” to reflect and to provide the proper tools for reflection, yet disseminate instruction in an “edutaining” way. “Structured opportunities for reflection can enable learners to examine and form their beliefs, values, opinions, assumptions, judgments, and practices related to an action or experience; gain a deeper understanding of them; and construct their own meaning and significance for future actions” (Moon, 1999, p. 596).

**Treatment Group 2: Feedback Only**

Treatment Group 2, made up of sections 1002, 1004, and 1005 students, received feedback based upon the RER on each reflection prompt. Students received the first prompt and were asked to write a reflection. The reflective exercise was assigned during week 9 of the semester. The reflections were scored and individual feedback was returned to the students in class, during week 15 of the semester. During this same week, Prompt 2 was distributed. Two weeks prior to finals at the end of the semester, students reviewed the feedback prior to the final reflection. Students were asked to write a reflection again, based on their group experience. No feedback was supplied to the students after the second prompt due to the time required for review and scoring of the documents at the end of the semester. However, the reflections were scored during summer 2011 using the RER. The reflections from the second prompt were submitted to the instructor during finals week.

Providing such feedback is a form of formative assessment often used by educators to provide explicit feedback to student to adjust ongoing teaching and improve students’ learning.
RER categories defined in this study utilize reflection for the development of skills identified as the most important to be developed in our students by Bowling Green State University. Feedback allowed for clear analysis of specific categories to be identified; for example, the level of reflection, the deepness of the reflection, and the interrelation of subject matter and group activities.

Relevance of impact on future performance was a critical part of the feedback. Students were asked to review the feedback, and apply what they learned to the second reflection. Table 3 outlined the RER and the “real-world” feedback provided to students in designated sections participating in the study. On the rubric, criteria boxes were checked according to the level indicated in the reflection provided by the student. Categories were weighted according to their importance as developed by experts in the field of teaching and learning.

**Treatment Group 3: Feedback, PowerPoint Tutorial, and Handout**

The final treatment group received all methods supporting reflection as they received feedback, viewed the PowerPoint, and received the handout. Three sections—1007, 1009, and 1011—received Prompt 1 during week 9 of the semester. During week 13, students viewed the PowerPoint tutorial and received the Reflection Handout. Students also received feedback from the rubric scoring from the RER. Prompt 2 was distributed week 15 of the semester. The second Reflection Prompt was returned to the instructor during finals week. No additional feedback was provided to the student. The second reflection was scored using the RER.

By using three alternative methods, instructors engaged in multimodal methods of instruction (Piaget, 1990). Multimodal methods of instruction stimulate students by exposing them to a multisensory presentation, thus engaging learners and increasing responsiveness, and

**Group 4: The Control - No Instruction/Feedback on Reflection**

The control group was used to provide baseline data and determine growth over the semester. Students in the Control group, sections 1001, 1003, and 1006, were introduced to Prompt 1 in week 9 and Prompt 2 during week 15. The control group did not receive feedback from RER (Table 3) scores after the first reflection. The control group did not receive the Reflection Handout or any instructional methods to facilitate the reflection. The second Reflection Prompt was returned to the instructor during finals week. The control group was used to compare the use of differing instructional methods as they compare to No methods.

**Instrumentation**

The instrument used in this study was the Reflection Evaluation Rubric or RER. Student learning (dependant variable) documented through reflection was evaluated and scored using the Reflection Evaluation Rubric. The RER was developed by the Center for Teaching and Learning and the College of Business Administration at Bowling Green State University.

Critical thinking and critical analysis are terms that are consistently used in academic settings to explain the requirements of students for their university work and provide feedback to students about what is lacking in their assignments. Although hard to define, critical thinking is often thought of as rigorous thinking. It has also been described as “the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from or generalized by observation, experience, reflection, reasoning, or communication, as a guide to belief or action [or argument]” (Scriven & Paul, 2001, p. 1). The RER was developed by experts in the Center for Teaching and Learning at
BGSU that understand and value this type of deliberate consideration. Reflection evaluation methods began at BGSU when the University joined the Electronic Portfolio Cohort in 1999 in conjunction with Inter/National Coalition for Electronic Portfolio Research (I/NCEPR). The INCEPR coalition focuses on assessment through four propositions: interaction of pieces of evidence, the relationship of evidence and reflection, material practice, and meaningful comparison without standardization. Educational teams from across the nation and Europe worked together to better understand the impact of reflective practice on student learning. The thinking skill categories of the RER are based upon Dewey’s model; however, they were influenced and supported by other literature from both the AAC&U’s VALUE project and the I/NCEPR. Table 5 displays the RER categories, definition according to theorists, and their support through the literature.

Table 5

*Definition of Thinking Skill Categories and Literature Support*

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Literature Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Thinking</td>
<td>Deep learning- critical thinking-reflection on action- applying-contextualized- making meaning- extended abstract-comprehending and re-interpreting- increasing knowledge</td>
<td>Dewey (1933), Bloom (1956), Kolb (1985), Schön (1983) and Bigg’s (1982)</td>
</tr>
<tr>
<td>Analysis</td>
<td>Analysis-generalizing-reflection in action- multi-structural</td>
<td>Dewey (1933), Bloom (1956), Kolb (1985), Schön (1983), and Bigg’s (1982)</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Synthesis-processing-making connections-relational</td>
<td>Dewey (1933), Bloom (1956), Kolb (1985) and Bigg’s (1982)</td>
</tr>
<tr>
<td>Honesty and Self-</td>
<td>Self awareness-experiencing uni-structural-comprehension</td>
<td>Dewey (1933), Bloom (1956), Kolb (1985) and Bigg’s (1982)</td>
</tr>
<tr>
<td>Awareness</td>
<td>Specificity-acquiring facts, pre-structural-memorizing-knowledge</td>
<td>Dewey (1933), Bloom (1956) and Bigg’s (1982)</td>
</tr>
</tbody>
</table>
The Association of American Colleges and Universities also known as AAC&U’s VALUE project has collected rubrics for each of the AAC&U’s Essential Learning Outcomes. The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty (Association of American Colleges, 2007). The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment (Association of American Colleges, 2007). The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses (Association of American Colleges, 2007). The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success. The VALUE project is analyzing the collection to find common criteria among the rubrics and will soon offer “meta-rubrics” that represent shared understandings of criteria and levels of the essential learning outcomes (Association of American Colleges, 2007). Content validity for the RER was established through alignment with the literature the AAC&U and I/NCEPR. In addition, an expert panel reviewed and confirmed its properties.

The RER assesses seven categories of thinking skills: deep thinking, analysis, synthesis, honesty and self-awareness, specificity, thoroughness, and clarity and correctness. Among the categories, students were evaluated at differing levels: beginning, intermediate, and expert. When using critical thinking skills, the student approaches a task comparing, refining, and
selecting from what he or she knows to find the best solution to the problem (Ewell, 1997a, p. 7).

The skills outlined are critically important to realize 21st century teaching practices in the classroom at BGSU and have been identified as key factor for each student to obtain as building blocks prior to graduation. These building blocks are also found in the 6 goals and 7 strategies identified by the University.

The categories of deep thinking, analysis, and synthesis were weighted heavier in the scores due to their importance, as detailed in Table 6. “Deep learning is learning that takes root in our apparatus of understanding, in the embedded meanings that define us and that we use to define the world” (Tagg, 2003, p. 70). Deep and integrative learning displays the underlying meaning of information and classroom content. Sources of information can be integrated into classroom and used to synthesize ideas. Students then begin to develop patterns or phenomena in concepts that display evidence to apply to their learning. The increase in knowledge can be applied to differing situations and provide alternative views and perspectives that develop student learning.

Student reflection category scores were developed through Rubric evaluation on three levels: expert, intermediate and beginning. Because reflective practice is normally evaluated from a qualitative perspective, the RER values were developed to represent the quality of reflection.

Table 6

<table>
<thead>
<tr>
<th>Categories</th>
<th>Expert (10)</th>
<th>Intermediate (5)</th>
<th>Beginning (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Thinking (10)</td>
<td>100</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Analysis (10)</td>
<td>100</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Synthesis (10)</td>
<td>100</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Honesty and Self-Awareness (5)</td>
<td>50</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Specificity (5)</td>
<td>50</td>
<td>25</td>
<td>0</td>
</tr>
</tbody>
</table>
In addition to reflective practice and electronic portfolio, several national instruments have been developed to better understand metrics related to a myriad of aspects regarding student learning. National instruments include: National Survey of Student Engagement (NSSE), Beginning College Survey of Student Engagement (BCSSE), Faculty Survey of Student Engagement (FSSE), Cooperative Institutional Research Program (CIRP), Your First College Year, (YFCY), College Student Experiences Questionnaire (CSEQ), Noel Levitz Student Satisfaction Inventory, ETS MAAP and Major Field Tests, ACT Collegiate Assessment of Academic Proficiency, and Collegiate Learning Assessment (CLA). This study identifies a more locally developed approach through the use of the Reflection Evaluation Rubric or RER, incorporating the critical skills of the AAC & U’s valid assessment of learning in undergraduate education rubrics as described by George Kuh (2008) and 21st century skills developed for the U.S. educational system.

Data Collection Procedures

The College of Business Administration constructed the agenda for the exercise. First-year students were prompted to reflect more systematically when prompted by the feedback they received during the course. All students received a consistent introduction to the study delivered by their professor during the course. A copy of the information sheet and an explanation of its purpose were also delivered to the students. Standardized instructional verbiage was provided to course instructors and concerns noted in the assumptions and limitations section of this document.
Freshmen College of Business Administration student reflections were collected throughout the spring 2011 semester for the assessment. Students taking the 1-hour course of study wrote reflections about their learning while performing group or team projects. The individuals responsible for administering the course received a description regarding the study to read to the class and a syllabus outlining the process. Reflection Prompt 1 was distributed week 9 of the course during the spring semester of 2011. PowerPoint treatments were initiated week 13 of the course. Sections receiving feedback obtained a copy in week 15 of the course. The second Reflection Prompt was disseminated week 15 of the course to all sections. Student scores were generated by RER scoring and provided feedback after Prompt 1. Prompt 2 reflection responses were returned to the instructor during finals week. Reflections were scored by the researcher according to a rubric developed by the Center for Teaching and Learning at Bowling Green State University. The scores were tabulated by course shell and saved as an Excel document.

**Research Questions**

1. What levels of thinking skills do freshmen business students demonstrate?
2. Do different instructional treatments affect student’s overall reflective practice?
3. Which thinking skills are most affected by the various instructional treatments?

**Data Analysis Procedures**

Descriptive statistics were utilized to identify the level of thinking skills among the participants and address Research Question 1. The type of treatment group (students receiving feedback only, students viewing PowerPoint only, students receiving feedback and viewing PowerPoint, and the Control) served as the independent variable while overall reflection growth was the quantitative dependent variable for Research Question 2. Overall scores were calculated as the sum of all thinking skill category scores. Growth scores were calculated as the difference
between pre and post (post-pre). Analysis of variance (ANOVA) was conducted to examine
group differences. Scheffe’ post hoc analysis determined which groups were significantly
different. Finally, eta squared as an effect size was calculated. Similar analysis techniques were
used to examine Research Question 3, which examined group differences in growth for each
thinking skill category. Data analysis for each of the three thinking skill categories are outlined
in the research questions in Table 7.

Table 7

Research Questions, Variables, and Data Analysis

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Independent Variables</th>
<th>Dependent Variables</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What levels of thinking skills do freshmen business students demonstrate?</td>
<td>Reflection level and Overall Scores (quantitative)</td>
<td>Descriptive Statistics</td>
<td></td>
</tr>
<tr>
<td>2. Do different instructional treatments affect student’s overall reflective practice?</td>
<td>Treatment (quantitative)</td>
<td>Overall Growth Scores (quantitative)</td>
<td>Analysis of Variance (ANOVA)</td>
</tr>
<tr>
<td>3. Which thinking skills are most affected by the various instructional treatments?</td>
<td>Treatment (quantitative)</td>
<td>Reflection growth (deep thinking, analysis, synthesis, honesty and self-awareness, specificity)</td>
<td>Analysis of Variance (ANOVA)</td>
</tr>
</tbody>
</table>

Assumptions and Limitations

The researcher assumed several aspects regarding the study. First, students assess and
document their behaviors accurately. Second, students were motivated to complete the tasks to
the best of their ability. Finally, the researcher assumed that treatment protocols were
administered consistently.
CHAPTER IV: RESULTS

The purpose of this quasi-experimental pretest posttest control group study was to examine the level of thinking skills that freshmen business students demonstrate, the effect of differing instructional treatments on students’ reflective practice, and which thinking skills are most affected by the various instructional methods. Educators are interested in determining if different treatment groups with differing instructional methods effect thinking skills among students. Instructional methods included: three treatment groups (students viewing PowerPoint and receiving a handout only, students receiving feedback only, students viewing PowerPoint, receiving a handout, and feedback) and one control group. The pretest and posttest was used to evaluate reflective practice among all groups. Participants included 411 freshmen students enrolled in the College of Business Administration at Bowling Green State University. Treatments were implemented and data were collected during spring semester of 2011. Students were evaluated based on reflection scores. This chapter presents the statistical results for each research question outlined in this study.

Research Question 1

What levels of thinking skills do freshmen business students demonstrate?

The purpose of education is to enhance student learning, however, responses from this study indicate that students come into college with a low level of thinking skills making enhanced learning problematic.

This research question examined the initial mastery (beginner, intermediate, and expert) and categories (deep thinking, analysis, synthesis, honesty and self-awareness, specificity, thoroughness, and clarity and correctness) of thinking skills as identified by the RER and used to evaluate student skill levels. The percent of participants ($n=253$) in each mastery level for each
thinking skill category is presented in Table 8. The results indicate that the majority of participants were categorized in beginner status for 5 of the 7 categories presented.

Table 8

*Percent in Mastery Levels by Thinking Skill Categories (n=253)*

<table>
<thead>
<tr>
<th>Thinking Skill</th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Thinking</td>
<td>79.8</td>
<td>0.8</td>
<td>19.4</td>
</tr>
<tr>
<td>Analysis</td>
<td>77.1</td>
<td>19.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Synthesis</td>
<td>72.3</td>
<td>25.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Honesty &amp; Self-Awareness</td>
<td>70.0</td>
<td>26.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Specificity</td>
<td>48.6</td>
<td>45.8</td>
<td>5.5</td>
</tr>
<tr>
<td>Thoroughness</td>
<td>26.1</td>
<td>72.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Clarity and Correctness</td>
<td>5.9</td>
<td>93.7</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Deep thinking, analysis, and synthesis are noted as the highest regarded skills by educators, however, Table 8 shows these categories as the ones with the greatest proportion in beginner status and ultimately requiring the most attention and improvement. Additionally, measures of central tendency and variability were calculated for each thinking skill category (see Table 9). Descriptive results from the first measure display an overall score mean of 60.95, which is quite low since it can range from 0 to 420.

Table 9

*Descriptive Statistics for Each Thinking Skill and Overall Score*

<table>
<thead>
<tr>
<th>Thinking Skill</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>Mode</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Thinking</td>
<td>0-100</td>
<td>9.80</td>
<td>19.81</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Analysis</td>
<td>0-100</td>
<td>13.44</td>
<td>26.30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Synthesis</td>
<td>0-100</td>
<td>15.02</td>
<td>25.43</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Honesty &amp; Self-Awareness</td>
<td>0-50</td>
<td>8.50</td>
<td>13.80</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Specificity</td>
<td>0-50</td>
<td>14.23</td>
<td>14.94</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Thoroughness</td>
<td>0-10</td>
<td>3.77</td>
<td>2.33</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Clarity and Correctness</td>
<td>0-10</td>
<td>4.72</td>
<td>1.23</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>PreOverall Score</td>
<td>0-420</td>
<td>60.95</td>
<td>83.18</td>
<td>0</td>
<td>25</td>
</tr>
</tbody>
</table>
Research Question 2

Do different instructional treatments affect student's overall reflective practice?

Research question 2 examined group differences in Growth scores of Reflective Practice. The independent variable was each of the Group or Instructional Method (T1 – students viewing PowerPoint and receiving a handout only; T2 – students receiving feedback only; T3 – students viewing PowerPoint, receiving a handout, and feedback; and Control) used in this study. The dependent variable was the Growth in Overall Reflective Practice Scores. Overall reflective scores were calculated as the sum of all thinking skill category scores. Growth scores were calculated as the Pre-Post difference for the overall RER score. Pre, post, and growth score means for overall reflective practice are presented in Table 10. Results indicate that Treatment Group 1 (students viewing PowerPoint and receiving a handout only) had the lowest pre score mean among the groups, while the Control Group had the highest. In contrast, post score results showed Treatment Group 3 (students viewing PowerPoint, and receiving a handout and feedback) had the highest mean, while the Control Group had the lowest. As such, Treatment Group 3 saw the most growth, followed by Treatment Group 2, Treatment Group 1, and the Control Group.

Table 10

Descriptive Statistics for Pre, Post, and Growth – Overall Scores by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Pre</th>
<th>SD</th>
<th>Post</th>
<th>SD</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>71</td>
<td>53.87</td>
<td>80.03</td>
<td>247.18</td>
<td>100.49</td>
<td>193.31</td>
</tr>
<tr>
<td>T2</td>
<td>61</td>
<td>60.25</td>
<td>75.74</td>
<td>287.30</td>
<td>80.83</td>
<td>227.05</td>
</tr>
<tr>
<td>T3</td>
<td>74</td>
<td>57.43</td>
<td>88.82</td>
<td>354.73</td>
<td>81.27</td>
<td>297.30</td>
</tr>
<tr>
<td>Control</td>
<td>47</td>
<td>78.09</td>
<td>88.08</td>
<td>234.04</td>
<td>114.73</td>
<td>155.96</td>
</tr>
</tbody>
</table>

The analysis of variance (ANOVA) was conducted to investigate significant group differences in growth scores for overall Reflective Practice. ANOVA results reveal significant
group differences in overall Reflective Practice growth as a result of differing instructional methods; $F(3,249)=15.70, p<.001, \eta^2=0.1591$. The large effect size indicates that the treatments account for nearly 16% of the variance in overall growth of reflective practice (Cohen, 1988). Post hoc analysis using a Scheffe’ test indicated that Treatment Group 3 and the Control Group significantly differed from all other groups.

**Research Question 3**

Which thinking skills are most affected by the various instructional treatments?

This research question utilized ANOVA to examine the effect of instructional differences on each thinking skill category growth score. Table 4 presents group means and standard deviations for each thinking skill category growth score. These descriptive results indicate that Treatment Group 3 (students viewing PowerPoint and receiving a handout and feedback) reported the most growth in all thinking skill categories, while the Control, which had no instruction or feedback, experienced the least growth in all categories. Treatment Group 2 (students receiving feedback only) followed Treatment Group 3 in growth for all categories, except for the category of honesty and self-awareness.

The thinking skills of analysis and synthesis showed the greatest growth for all groups (see Tables 11 & 12). ANOVA results indicate significant group differences for all thinking skill categories; however, effect sizes reveal that the instruction treatments had the greatest impact on deep thinking and synthesis. Treatment had a large effect on deep thinking; 17.19% of the variance in deep thinking is accounted for by the independent variable.

Post Hoc Scheffe’ results reveal that T3 differed from T1 and the Control Group in all skill categories with the exception of specificity. In addition, T3 differed from T2 in deep thinking and honesty and self-awareness. Interestingly, the skill category of specificity only
produced a difference between T1 and Control. Effect Sizes indicate that the treatment had the greatest impact on deep thinking and synthesis.

Table 11

*Descriptive Statistics for Each Thinking Skill Category (Growth Score) by Treatment Group*

<table>
<thead>
<tr>
<th>Thinking Skill</th>
<th>Treatment 1 (n=71)</th>
<th>Treatment 2 (n=61)</th>
<th>Treatment 3 (n=73)</th>
<th>Control (n=47)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Deep Thinking</td>
<td>41.55</td>
<td>32.72</td>
<td>46.72</td>
<td>23.93</td>
</tr>
<tr>
<td>Analysis</td>
<td>57.04</td>
<td>37.13</td>
<td>64.75</td>
<td>32.07</td>
</tr>
<tr>
<td>Synthesis</td>
<td>47.89</td>
<td>37.26</td>
<td>62.30</td>
<td>39.43</td>
</tr>
<tr>
<td>Honesty &amp; SA</td>
<td>24.30</td>
<td>19.35</td>
<td>22.95</td>
<td>14.65</td>
</tr>
<tr>
<td>Specificity</td>
<td>22.54</td>
<td>18.01</td>
<td>30.33</td>
<td>17.15</td>
</tr>
</tbody>
</table>

Table 12

*ANOVA Results for Group Differences of Growth Scores in Each Thinking Skill Category*

<table>
<thead>
<tr>
<th>Thinking Skill</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>η2</th>
<th>Differing Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Thinking</td>
<td>3,348</td>
<td>17.16</td>
<td>&lt;.000</td>
<td>.1719</td>
<td>3 from 1,2,4</td>
</tr>
<tr>
<td>Analysis</td>
<td>3,249</td>
<td>8.28</td>
<td>&lt;.000</td>
<td>.0907</td>
<td>3 from 1,4</td>
</tr>
<tr>
<td>Synthesis</td>
<td>3,249</td>
<td>13.43</td>
<td>&lt;.000</td>
<td>.1393</td>
<td>3 from 1,4</td>
</tr>
<tr>
<td>Honesty &amp; Self-Awareness</td>
<td>3,249</td>
<td>7.16</td>
<td>&lt;.000</td>
<td>.0794</td>
<td>3 from 1,2,4</td>
</tr>
<tr>
<td>Specificity</td>
<td>3,249</td>
<td>7.22</td>
<td>&lt;.000</td>
<td>.0800</td>
<td>1 from 4</td>
</tr>
</tbody>
</table>

Summary

This study evaluated the level of thinking skills that freshmen business students demonstrate, the effect of differing instructional treatments on students’ reflective practice, and which thinking skills are most affected by the various instructional methods.

Results for Research Question 1 reveal that freshmen College of Business Administration Students have low level thinking skills as pretest scores showed the majority scoring in the beginner status for most categories. Synthesis, for example, had 72% of students in the beginner category. Substandard deep thinking and analysis scores ranged closer to 80% in the beginner category for the college freshmen.
Results for Research Question 2 indicate that Treatment Group 3 (PowerPoint, handout, and feedback) saw the most growth in overall Reflective Practice, followed by Treatment Group 2 (feedback), Treatment Group 1 (PowerPoint, handout), and the Control Group. Treatment Group 3 significantly differed from all other groups. Nearly 16% of the variance in overall growth of reflective practice was attributed to treatment.

ANOVA was also utilized to examine which thinking skills were most affected by various instructional methods. Results indicate that Treatment Group 3, the combination of methods, had the greatest impact on all thinking skills with the exception of specificity. The treatment had the greatest impact on the skills of deep thinking and synthesis.

Table 13

Summary of Statistical Results by Research Question

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What levels of thinking skills do freshmen business students demonstrate?</td>
<td>• The majority of student skill levels in the beginner category in 5 of the 7 categories evaluated.</td>
</tr>
<tr>
<td>2. Do different instructional treatments affect student's overall reflective practice?</td>
<td>• The use of a combination of instructional methods had the most positive impact on student thinking skill growth.</td>
</tr>
<tr>
<td>3. Which thinking skills are most affected by the various instructional treatments?</td>
<td>• Category scores for Deep Thinking and Synthesis displayed the most improvement due to varied instructional treatments.</td>
</tr>
</tbody>
</table>
CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

“Education, therefore, is a process of living and not a preparation for future living.”

John Dewey

This chapter presents a review and summary of this study on the impact of treatments on student reflective practice in the college classroom. The chapter will present a review of the study and the significance treatments have on reflective practice. The results of the data analysis are explored in the context of each research question. Recommendations for educators, employer opportunities, implications for leadership, and future research will be presented.

Review of the Study

This study was conducted to examine student reflective practice among three treatment groups (students receiving feedback only, students viewing PowerPoint only, and students receiving feedback and viewing PowerPoint) and one control group. The research evaluated pretest and posttest groups’ reflective practice, which was evaluated using the Reflection Evaluation Rubric (RER). Participants included 411 freshmen students enrolled in the College of Business Administration at Bowling Green State University. Treatments were implemented and data were collected during spring semester of 2011.

Discussion

Research Question 1

What levels of thinking skills do freshmen business students demonstrate?

With regard to the mastery level of each thinking skill category, student scores displayed the beginner level among the top three thinking skills most valued by educators: deep thinking, analysis, and synthesis. Scriven and Paul (1997) noted the importance of critical thinking as an examination of structures or elements of thought implicit in reasoning. Scriven and Paul are
Examples of educators and leaders that value critical thinking skills because they believe these skills help students to make assumptions, understand concepts, develop reasoning that leads to conclusions, state implications and consequences, and develop objections to alternative viewpoints (Scriven & Paul, 1997). This result reaffirms concerns of educators and is consistent with numerous studies.

These lower scores can translate into difficulty with problems solving classroom assignments and also in the workplace. Critical thinking skills in many cases are as equally important as content knowledge (Kuh, 2008). Thinking skills allow students to clarify their goals, make assumptions, examine evidence, take action, and evaluate outcomes. Scores such as clarity and correctness were significantly higher, in the intermediate range, indicating familiarity and a focus and/or a mastery of learning in this area.

In a national survey of college professors conducted by the Chronicle of Higher Education, 44% of college faculty members reported that their students “are ill prepared for the demands of higher education” (Sanoff, 2006, p. 1). Of the students that attend college, about 25% of first-time students at 4-year colleges and universities require at least 1 year of remedial courses (Kuh, 2005). The State of Ohio has the fifth largest public higher education system, with all but one of the public colleges offering remedial courses to incoming freshmen. Ohio students, specifically identified as No age undergraduates (18 to 20 years old) entering college as first-time full-time freshmen in the fall of 1998, were among those categorized as under-prepared.

In another study, results indicated a large number of recent high school graduates and incoming freshmen require remediation. Hoyt and Sorensen found that students who complete an academic core curriculum in high school are half as likely to need remediation in college (Hoyt & Sorensen, 1999; OBR, 2002). However, among students that completed the curriculum, 25%
still required remediation. As expected, ACT scores mirrored remediation requirements.

Research from both national and state or local perspectives indicate that high school students do not demonstrate the thinking skills required to begin their college career. However, according to a recent study by The College Board, nearly 50% of high school students taking Advanced Placement (AP) courses do not pass the exams to qualify for college credit (Driscoll, 2012). The article noted that while AP students are generally at the top of their class academically, they have become excellent “exam passers.” The article explained that students are unprepared for the rigors of college level coursework. Driscoll (2012), detailed that the increase of high school students taking AP courses has required more teachers be assigned to the preparatory curriculum and advanced classes, thus reducing the quality of teachers at the lower academic levels for the majority of students. Wagner (2010) agreed in regards to the importance of preparatory coursework for skills such as reasoning, problem solving, and so on, being only provided to a small number of students.

Statistics from Wagner’s (2010) book, The Global Achievement Gap, indicate that 65% of college professors reported that what is taught in high school does not prepare students for college. Wagner pointed out that one major reason for this is that the tests students must take in high school for state accountability purposes usually measure ninth or tenth grade level knowledge and skills. The assessments are generally multiple-choice and rarely ask students to explain their reasoning or apply knowledge to new situations—skills that are critical for success in college. Wagner (2010) continued to describe the lack of feedback provided to the teacher and the student about college readiness. Mastery of basic skills such as reading, writing, and math will not suffice in the 21st century. Thus, learning to think, to reason, analyze, weigh evidence, and problem solve or the mastery of thinking skills are essential survival skills (Wagner, 2010).
Wagner (2010) detailed a simple explanation for the low levels of intellectual work as a general lack of curiosity, and that schools were never designed to teach students how to think. The results of this study mirror the achievement gap assumption.

**Research Question 2**

Do different instructional treatments affect student’s overall reflective practice?

ANOVA results showed that differing instructional treatments affect students’ overall reflective practice. Reflective practice is the capacity to reflect on action so as to engage in a process of continuous learning. The instructional treatment that produced the greatest growth in overall reflective practice was Treatment 3, in which three types of instructional methods (PowerPoint, handout, and feedback) were combined to reach all learning types and facilitate deeper thinking and analysis of information. Interestingly, the feedback-only group (Treatment Group 2) showed a slight advantage over the use of a PowerPoint presentation and handout (Treatment Group 1). It was only when the treatments were combined (Group 3) that the impact of all three instructional methods—PowerPoint, handout, and feedback—were significantly noted. The Control Group, which did not receive any materials, instruction, or feedback, showed the least amount of growth. Therefore, it can be concluded that a combination of instructional treatments including visual, auditory, mixed-media, and feedback will result in the greatest amount of growth in reflective practice.

Poor student thinking skills make it difficult for educators to build on a relatively weak foundation for learning. Historically, higher education has attempted to achieve student learning through focusing on teaching rather than learning (Barr & Tagg, 1995). The difference between these two paradigms may be understood simply as changing focus from how to teach better to how to produce better learning, “by whatever means works best” (Barr & Tagg, 1995, p. 13).
Barr and Tagg (1995) recognize the importance of changing to a learning model, using a broad context and multiple instructional methods for a more holistic approach to learning. As noted in Chapter II of this document, synthesized and integrated learning uses all aspects of a student’s cognitive ability (Ewell, 1997a). Thus, varied instructional methods are important to maximize student learning through linking cognitive processes to student learning styles. The following discussion will address the need for a variety of instructional methods in the classroom and the importance of feedback.

**Instructional variety.** Traditional methods of instruction for course credit involve an instructor in a classroom lecturing on course content and prompting discussion to promote student learning. However, research from this study indicated a variety of instructional methods are needed to improve student thinking skill growth. These results are supported by numerous recent studies.

In a study of college student perceptions of traditional lecture methods, traditional lectures compared to active learning strategies were examined. The study participants were students enrolled in two sections of a 200-level psychology class. Fifty-one of 60 students responded to the 13-item course evaluation survey regarding student perceptions of the effectiveness of traditional lecture. The results of the study indicated that students felt the material provided in the lecture would be retained; however, students also acknowledged they missed class participation and peer discussion, which are active learning strategies. Further results detailed that students had to rely on the instructor to tell them what they need to know, limiting the development of independent thinking, problem solving, and deep, long-lasting learning (Covill, 2011).
The healthcare industry is interested in creating learning environments that promote critical thinking, decision making, and transfer knowledge. In a study on the effectiveness of multimedia instruction in health professions education, pedagogical strategies using multimedia were compared to traditional instructional pedagogies (Stegeman & Zydney, 2010). Study findings indicated a significant increase in application of knowledge when the researcher used a tutorial and a clinical setting to educate students. Improvements in problem solving were also noticed as compared to lecture. The study described concerns related to healthcare education being plagued with the crisis of retention of knowledge and transfer to practice. Results indicated that multimedia instructional design was more effective than no instruction for the attainment of knowledge, skill, and performance (Stegeman & Zydney, 2010). According to the National Survey of Student Engagement (NSSE), results from the 2009 annual survey of first-year and senior students that attend 4-year colleges detailed a side-by-side comparison to discover the relationships between faculty use of effective educational practices and student engagement. The annual study incorporated information from more than 850 different 4-year colleges (Kuh, 2008). Results indicated that institutions where faculty emphasized a range of effective educational practices reported making more progress since starting college on various dimensions of student learning and personal development. The NSSE study also indicated that when faculty members emphasized thinking skill development, students engaged in more integrative learning activities. The integrative learning measure is composed of six behaviors which are essential to acquiring the skills and competencies needed to become an integrative learner.

The activities are listed below:

- Worked on a paper or project that required integrating ideas or information from various sources.
• Included diverse perspectives (different races, genders, political beliefs, etc.) in class discussions or writing assignments.

• Put together ideas or concepts from different courses when completing assignments or during class discussions.

• Discussed ideas from readings or classes with faculty members outside of classes.

• Discussed ideas from readings or classes with others outside of classes (students, family members, coworkers, etc.)

• Synthesized and organized ideas, information, or experiences into new, more complex interpretations and relationships.

The study results displayed the need for faculty members to use a variety of active and collaborative learning activities, and that students who are more likely to be actively involved in a variety of educationally purposeful activities are more likely to report greater academic gains associated with their experiences (Kuh, 2008). These instructional methods allow students to gain valuable knowledge and blend information with prior knowledge and experiences to create new knowledge. Research findings from this study agreed—exercising multiple instructional methods can improve student skills. In addition, multiple learning styles can be reached through the use of integrated learning strategies. Decades of research studies on student development suggest that students who engage in a variety of educationally purposeful activities report gaining more from college compared with their peers who engage less frequently in such activities or who focus on only one or two areas (Pascarella & Terenzini, 1991).

The concept of critical thinking may be one of the most significant trends in education relative to the dynamic relationship between how teachers teach and how students learn (Mason, 2010). Evidence suggests that classes without formal classroom instruction rarely lead to critical
thinking (Lizzio & Wilson, 2007). Multiple instructional strategies, as demonstrated in this study, can increase in-class learning and overall college student retention. When multiple strategies of instruction utilized in the classroom assist students in retaining what they have learned and when students see a topic from differing angles, students naturally increase retention and transfer (Bransford, Brown, & Cocking, 2000). In this study, Treatment 3 (T3) was found to be the most effective treatment because of the use of a variety of instructional methods to increase learning and student engagement. Traditional methods of instruction often lead to disengagement and inattentiveness and do not encourage student discussion or allow students time to reflect on learning. This leads to a lack of the students’ ability to make connections between the students’ past coursework, personal experiences, and current instruction to in an effort to deepen learning. Dewey (1933) believed that educators need to understand each student’s unique differences and that past experiences influence future learning. Therefore, classroom curriculum design needs to address individual differences.

The concept of creating understanding students relating current knowledge to prior knowledge is called constructivism. Constructivism explains why different instructional treatments impact the students’ reflective practice. When presented with a problem, the student constructs his/her interpretation of the situation by referencing prior experiences (Rogers, 1960). Dewey (1938) noted that knowledge emerges only from situations in which learners have to draw them out of meaningful experiences. Dewey saw the importance of engaging in meaningful activity. By providing alternatives in the instructional methods, different options become available to students, and they are able to determine the option that is meaningful to them. Brooks and Brooks (2005), detailed the constructivist classroom in their book, *In Search for Understanding: The Case for Constructivist Classrooms*. The authors listed five principles of
constructivist pedagogy: (a) posing problems of emerging relevance to learners, (b) structuring learning around “big ideas” or primary concepts, (c) seeking and valuing students’ points of view, (d) adapting curriculum to address students’ suppositions, and (e) assessing student learning in the context of teaching. Educators can use these techniques to deepen understanding of course content. Brooks and Brooks (2005) went on to describe constructivist teaching behaviors and encouraged experiential learning through this approach. They noted that this type of teaching empowers students to construct their own understanding of content, not simply as a provider of information, but to use educators to manage learning behavior (Brooks & Brooks, 2005).

In this study, Treatment 3 (T3) aligned with constructivist instructional methods through the learning cycle model developed by Kolb. The learning cycle model has been used in education for many years. The model outlines curriculum development and instruction as a three step cycle: discovery, concept introduction, and concept application. Treatment 3 began the learning cycle model with the use of a handout. The handout provided information to introduce the concept to the class. The second step was the presentation of information via PowerPoint. The PowerPoint continued the concept introduction phase but also introduced the discovery phase of the exercise. Next, students were asked to respond to prompts regarding their learning experiences through written reflection which was a continuation of the discovery phase of the learning cycle model. Written reflection was also the beginning of concept application. Concept application continues through the feedback provided by the instructor through the use of the rubric or RER. Buxton (2011) detailed the importance of students engaging in one or more interactions of the discovery-concept introduction sequence. He noted that students work on new
problems with the potential for evoking a reflective, new look at concepts studied previously (concept application).

A new instructional method found to transform classroom learning and student engagement is problem-based learning (PBL). At McMaster University, problem-based learning (PBL) has been an instructional method used since the early 1970s. However, in 2002, the college decided to review and potentially improve their problem-based medical education program. Student feedback was part of the redesign process. Results indicated that 86% of students “preferred a small-group, web-supported, problem-based learning approach led by content experts who facilitated group process.” The study found that student preferences link to increased learning and student retention for the college. Developing a formulation of activities for active learner involvement has been a challenge for educators for many years. This may be due to a variety of learning styles needing to be addressed. Visual, auditory, kinesthetic learners all learn differently. Treatment Group 3 engaged multiple senses, thus reaching more students to understand or absorb the mixed method instruction.

The importance of feedback. Although results indicated that feedback alone did not have the greatest impact on reflective practice, it certainly was a necessary component of Treatment 3, the combined instructional strategy. In addition, the feedback-only group (T2) saw more growth in Overall Reflective Practice than T1, the handout/PowerPoint group. Feedback is critical to learning. Educators can assist knowledge-transfer by providing proper feedback on students’ activities. A preponderance of education literature suggests a shift from passive, knowledge-transfer instructional methods to interactive, experiential learning (Frontczak, 1998). Instructional methods that lead to improvements in learning through the use of feedback are considered active classroom activities, such as problem or project-based learning activities.
These strategies allow students to interact with each other and provide immediate feedback among peers, thus increasing opportunities for engagement and learning. Empirical evidence supports that business students prefer pedagogies that are active and concrete (Nulty & Barrett, 1996), prefer learning with other students (Matthews, 1994), and prefer instructional pedagogies that are stimulating and real-world oriented (Karns, 1993). A study by Young, Klemz, and Murphy in 2003 found that when student-preferred instructional methods were used, student learning outcomes increased.

Results found that the Reflection Evaluation Rubric (RER) was an effective feedback tool for students. Educators were able to identify concerns related to students’ reflections and respond to those reflections with specific information required to improve academic and reflection performance. While not all students may have reviewed the feedback provided, the results from this study indicated that a majority reviewed the information and altered their behavior for the second reflection. Rubrics provide students with helpful criteria for success, making desired learning outcomes clearer to them. Criterion-referenced feedback provides the right kind of guidance for improving student understanding (Crooks, 1998). Rubrics pinpoint specific need and help focus students providing direction for improvement allowing educator feedback to reinforce student learning. According to Crooks (1998), informative feedback is important to student growth. He noted, when feedback is corrective, intentionally directed to correct errors in student work, it becomes part of student learning. Providing feedback in the proper timeframe is important to student learning. The greater the timeframe becomes, the lesser the connection is made, thus reducing student benefits of feedback (Crooks, 1998).

Feedback has been shown to be one of the most significant activities a teacher can engage in to improve student achievement (Hattie, 2009). Results from this study indicated that feedback
was effective in all areas; however, when combined with differing instructional treatments, greater gains were made with regard to student learning. Feedback is more beneficial to students than a presentation and handout because it leads to higher learning. According to Black and William (1998), “the provision of challenging assignments and extensive feedback lead to greater student engagement and higher achievement” (p. 13). They believed feedback is necessary to attain specific goals. Feedback can be used to inform individuals:

As to what type or level of performance is to be attained so that they can direct and evaluate their actions and efforts accordingly. Feedback allows them to set reasonable goals and to track their performance in relation to their goals so that adjustments in effort, direction and even strategy can be made as needed. (Locke & Latham, 1990, p. 3)

In this study, the power of effective feedback provided the immediate direction on how to improve performance.

**Research Question 3**

Which thinking skills are most affected by the various instructional treatments?

Study results indicated that Treatment Group 3 (students viewing PowerPoint and receiving a handout and feedback) reported the most growth in all thinking skill categories, while the Control Group experienced the least growth in all thinking skill categories. It is important to note that the Control Group did see minimal improvement between reflections. The slight change is due to the use of reflection displays that students are thinking about their learning, even though they did not receive instruction on how to improve their reflection. Interestingly, the varying treatments had the greatest impact on the skills of deep thinking and synthesis. Although these conclusions seem fairly simplistic, the results call for a closer review to fully understand the differences across groups and thinking skill categories. This discussion will focus on the three
critical thinking skills: deep thinking, analysis, and synthesis. Only T3 showed the greatest growth in the synthesis category; in contrast, the other three groups reported the most growth in the category of analysis. It should be noted that T2, the feedback-only group, performed quite well in the category of synthesis. Despite the significant group differences in analysis, since all groups showed growth, the varying treatments had the least impact on analysis ($\eta^2=.0907$). Finally, all groups showed the least amount of growth in the category of deep thinking; however, T3 still outperformed the other groups by a large margin. As such, the varying treatments produced the greatest effect on the thinking skill categories of deep thinking ($\eta^2=.1719$) and Synthesis ($\eta^2=.1393$).

Differing college and high school curriculum may explain why analysis scores among all groups were proficient. High schools challenge students on course content and focus more on analysis; however, they do not spend class time on other cognitive strategies (NSSE, 2006). Reflection prompts lend themselves to analysis. Freshmen students have a familiarity with analysis which is displayed in the improved scores among all groups. College is the first setting where we expect organized and document work with evidence from credible sources (NSSE, 2006). High school students may write one to two page papers, having an extended period of time to complete the work, while college students require well-developed research and writing abilities and critical thinking skills (Conley, 2011). Conley (2011) suggested a structure that facilitates a logical progression and development of knowledge mastery over 4 years of high school instead of the isolated course-based model that currently exists. According to the National Survey of Student Engagement (2006), a vast majority of first-year college students are actively engaged in small groups and are expected to work on complex problems and projects with others inside and outside of class which leads to improved deep thinking and synthesis skills. High
school students do not spend as much time on these tasks explaining why scores are lower in these areas in this study.

Improvement in thinking skills leads to educational and personal growth. Espeland and Shanta (2001) argued that faculty that only lecture as their primary instructional method may be enabling students. In preparation for lecture, the instructor organizes and presents information without student input. Students do not have an opportunity to decide what information is important for them to know. This type of instruction lessens the need for deep thinking. Deep or critical thinking requires reflective thought. Students must ask questions that lead to discussion, examination, explanation, or comparison. Deep thinking requires an examination of personal perspectives, values and beliefs, interpretation, and application of one’s own thoughts or thoughts furthered by group discussion. Deep thinking requires continued follow-up questioning to deepen understanding. In this study, T3 used combined instructional methods which are known to lead to deeper learning, thus displaying improved scores over the other groups. Multiple methods used in T3 reinforced deep thinking and synthesis skills. Feedback also provides specific attributes that enhance deep thinking and synthesis skills. The use of a variety of teaching strategies can enhance learning by capitalizing on the differences in learning needs and styles (Cisco, 2008).

Treatment Group 3 or T3 used instructional methods such as feedback, PowerPoint, and handout in combination to influence these thinking skills. There were several reasons the instructional methods may have had a greater impact on deep thinking. One explanation for thinking skill improvement in T3 is due to the use of PowerPoint technology or the use of multimedia, which increased student engagement and outlined the process and expectations clearly and effectively. In the PowerPoint, students were prompted to think deeply about their
reflections. Students were able to see, hear, and connect with course content through this instructional method and the results clearly showed the improvement in deep thinking scores due to this strategy. This allowed students to improve their reasoning skills and increase disciplined thinking about the given topic.

Feedback had the greatest impact on deep thinking scores through the use of a Reflection Evaluation Rubric (RER). Educator comments and responses to student work were clear, constructive, and directed. The Rubric defined expectations for improvements and detailed the students’ current standing with regard to those expectations. Students improved their understanding of the content and course expectations. The handout was supplemental material that defined processes; however, in combination with the PowerPoint and feedback, it created a rich understanding of the material presented.

Henning (2011) suggested five methods for improving synthesis in student writing. His research indicated that when educators provide feedback to students it leads to synthesis and improves learning. This explains why T3 displayed better scores than T2 in the area of synthesis. Synthesis is to build up or connect separate pieces of information to form a larger, more coherent pattern. Examples can be found through the integration of information or combined concepts to create a more complete view of a topic. Students were able to classify different subject matter groups to form a more general category. Another way to synthesis was recognized in this study was when students were able to reorganize their ideas for a bigger picture perspective of the content. Synthesis improved due to the integration of instructional methods that created a larger picture of learning outcome expectations. Students’ are able to view all aspects of the topic, delivered from different sources to make connections and help shape concepts and support ideas.
Strong skills in the areas of deep thinking and synthesis imply that transfer understanding was developed and will assist students in applying their new knowledge to other coursework or projects.

**Conclusions and Recommendations for Instruction**

This study and its results lead to three primary conclusions. The following section presents these conclusions and provides related recommendations for instruction.

**Conclusion 1**

Students are coming to college with low level thinking skills. In an effort to improve the situation, researchers have outlined the need for reflection as a key component of teaching students critical thinking (Grossman, 2009). It is important that colleges and universities make deliberate efforts to develop programs related to critical thinking. In Australia, all universities are required to pronounce graduate attributes to be developed in students. Critical thinking is one of the main objectives or attributes included. This study has informed us that first-year students are not prepared for college, thus encouraging the development of a college course geared toward developing critical thinking skills. Developing first-year students’ critical thinking skills, in turn, develops graduates that are confident in their decision making and are able to make connections and apply learning. Phil Race (2001) maintained reflecting causes us to make sense of what we have learned, why we learned it, and how that particular increment of learning took place. He furthers, reflection is about linking one increment of learning to the wider perspective of learning—heading towards seeing the bigger picture. Graduates of the future will need to deal with the unknown and solve problems that may not even exist currently (Boud & Falchikov, 2006). Kurfiss (1988) believed that university students should have developed their ability to think critically prior to attending university and that they either have the ability to think critically
or they do not. Conversely, this study suggests that this type of learning can be taught; at a minimum, it can be enhanced by alternative instructional methods. According to Paul, Elder, and Bartell (1997) in a study in California, although 89% of academics thought critical thinking was the primary objective of their subject, only 19% could explain what critical thinking really was, and only 9% were actually teaching critical thinking skills.

**Conclusion 2**

A variety of instructional methods is needed to improve thinking skills among students. Determining the best combination of instructional methods is challenging, however, this study supports the use of the instructional handouts, media, and feedback to further students’ critical thinking skills. According to Gagne, Briggs, and Wagner (1992), the best instruction is that which is:

- **Effective** – facilitates learners’ acquisition of the prescribed knowledge, skills, and attitudes
- **Efficient** – requires the least possible amount of time necessary for learners to achieve the objective
- **Appealing** – motivates and interests learners and encourages them to persevere in the learning task
- **Enduring** – encoded in long-term memory, accessible, and applicable in the future

Gagne, Briggs, and Wagner (1992) felt it necessary to have students participate actively through cognitive processes and also physically interacting with the material covered in the course. Study results align with this research. Each instructional method (treatment) applied collectively encompassed Gagne, Briggs, and Wagner (1992) instructional best practices. For example, instructional methods such as handouts are an effective method of delivering content to
facilitate learners’ acquisition of knowledge. The use of a one page reflection is an efficient use of time to ensure learners understand and met the course objectives. The use of a PowerPoint presentation was appealing to students, creating interest surrounding the learning objective. Finally, the use of a rubric to measure student learning outcomes and provide feedback to students about their learning is an enduring practice that assists students in their development and application of knowledge in the future.

Wagner (2010) described a greater issue that stems from educational foundations. He suggested that teachers have not been trained to teach students how to think and textbooks and tests from the past were not designed to teach and assess the ability to reason or analyze. In this study, the most growth was found in the skills of deep thinking and synthesis; this was due to students engaging in multiple instructional methods. Another example of this effect was found in China at a University in Hong Kong. Undergraduate nursing students were examined using a pretest/posttest study designed to evaluate the effects of using videotaped vignettes to promote first- and second-year nursing students’ critical thinking skills. A test of critical thinking skills was performed and participants (n=83) completed questionnaires testing knowledge of the specific vignette viewed. Results from posttest knowledge scores indicated the scores were significantly higher than pretest scores, although there was no significant difference between the pre and posttest variables and critical thinking scores. First-year students were the only students found to have evidence of statistically significant improvement from pretest to posttest knowledge scores. California Critical Thinking Skills Test (CCTST) was used as a measure for critical thinking skills. Study results suggested the use of vignettes to support student learning.

Co-ops and internships have been known to increase student learning and offer another avenue for student growth. Cooperative education programs were established initially to bridge
the gap between theory and practice in engineering education, meet the new developments in industrial needs, and make university education accessible to the growing number of students (Lebold, Pullin, & Wilson, 1990). Co-ops can be used to prompt reflection and increase learning. The idea of cognitive apprenticeship based on processing, judgments, and sense-making supplies students with access to experts in their daily roles, who in turn provide direct feedback to students about their performance (McGuiness, 1993). Student skills and experiences learned in co-ops and internships positively influence later success in the workplace. Learning partnership models link learning with self-authorship—the journey into self-discovery based on increasing intellect (Baxter Magolda, 2007).

**Conclusion 3**

Feedback is critical to improve thinking skills among students. Instructional feedback can be used in many ways as a method to improve critical thinking skills among students. For example, Michaelsen, Sweet, & Parmelee (2008) discussed team-based learning, where students take a multiple choice test individually and then after the test, they answer the same questions as a group using the Immediate Feedback Assessment Technique (IF-AT). The instructional method was developed by a psychology professor, Dr. Mike Epstein, who specialized in human learning and memory. The IF-AT technique provides immediate feedback on multiple choice questions, assesses and teaches to ensure content objectives are met, and allows students to learn by knowing the answers opposed to believing they have chosen the right one. The goals are achieved through the use of a scratch off of a multiple choice testing sheet.

Assessment feedback helps to develop critical thinking, however, needs to include feedback on the students critical thinking skills, student feedback is often vague, therefore, does not promote learning these skills. Wingate and Meece, (2010) proposed that there is often a gap
between the feedback that academics think they are providing and the students’ understanding of that feedback. By providing direct guidance, students will realize their full potential in the development of higher order thinking skills. When embedding the development of critical thinking and meta-cognitive skills within the learning of the discipline, it is crucial for students to receive effective, deliberate practice in the skills and to be provided with appropriate feedback (Archibald, Thomas, & Tenenbaum, 2010). Rubrics measure both ability and knowledge of a student. A rubric allows teachers to measure certain skills and abilities not measurable by standardized testing systems that assess discrete knowledge at a fixed moment in time (Reeves & Stanford, 2009). Rubrics encourage self monitoring and self-assessment and give structure for a final grade on an end product (Association of American Colleges, 2007).

**Leadership and Policy Implications**

Critical thinking skills are an essential part of effective leadership. Workplace leaders deal with complex problems. Leader requirements have shifted over time, and expectations have increased. Researchers in the area of leadership have subdivided the concept of effective leaders in the workplace into new theories for transformational leadership (Bass, 1990), servant leadership (Greenleaf, 1977), authentic leadership (Avolio & Gardner, 2005), leadership from a sense-making perspective (Weick, 1995). These reflective components can be enhanced by improved critical thinking skills and affect behavior and moral and ethical decision making in the workplace. Critical thinking from a leadership perspective entails the ability to think complexly (Senge, 1990). Senge believed leaders must be able to see the big picture and assemble all the new and disparate pieces of information into a meaningful whole. Strong critical thinking skills allow leaders to engage problems and employ logic for resolution. In critical thinking, intellectual criteria is also applied. Skills such as accuracy, relevance, depth and breadth,
understanding consequences, determining significance of a subject, and/or ethical decision making have a large affect on leader success. Leader traits regarding reflective thought include analysis, synthesis, and continued questioning to create connections and understand situational context. Although this document does not answer the age old question of whether leaders are born or made, it does support the notion of and detail how educators can influence leader traits for enhanced performance.

Students’ ability to reach their full potential may be limited if their ability to think critically is not developed as first-year university students. Students need to grasp the importance of a critical thinking approach in order to be skilled employees and effective leaders who are able to adapt to new situations in the workplace (Forrester, 2008). First-year critical thinking skill development allows for practice and successful application of skills throughout their college experience and their life. Leadership through the use of critical thinking is valued as an important skill by employers and is one that they look for in applicants for a job (Hager, 2002).

In 2006, a study was performed to determine if “readiness for college” or “readiness for work” are the same or different. The ACT study results provided empirical evidence that whether students are going to work or headed to college, they require the same level of readiness in the area of mathematics (College and Workforce Training Readiness, 2006). The study measured reading and mathematics skill levels and also compared scores from ACT tests that measure workforce readiness with those that measure college readiness. Results from the study noted the need for a common academic expectation for students entering the workforce and those entering college. Recommendations from the study indicated although assessments may differ, expectation levels must be equal among groups. A lack of foundation for high school graduates academic skills was exposed and the results suggested that student skill levels are not equal, nor
are they to standard indicating a need for curriculum reform. The study did however provide recommended action steps for state policymakers to improve high school graduates’ preparedness for college or for work. The following is a listing of those recommendations:

- Use the common expectation to establish a statewide commitment that all students will be prepared for college and workforce training programs when they graduate from high school.
- Require that all students take rigorous core preparatory course programs in high school.
- Hold schools and states accountable for preparing all students for college and workforce training programs through rigorous core courses.
- Ensure that state standards reflect the skills needed for college and workforce training readiness for all students.
- Provide funding for measures of college and workforce training readiness skills to be used as statewide high school assessments.
- Begin measuring student progress with aligned assessments as early as the eighth grade to monitor progress, make appropriate interventions, and maximize the number of high school graduates who are ready for college and work.
- Use common expectation of college and workforce readiness as a prerequisite for entry into development programs and offer remediation for those that do not meet the expectation.
- Communicate the common expectation of college and workplace readiness to all stakeholders, including businesses, workforce and economic development associations, and educational institutions.
The implementation of these strategies will increase student preparedness for college and for work, therefore enhancing academic and workplace success.

**Recommendations for Future Research**

This section presents recommendations for future research. Opportunities for future research include multimedia and other instructional methods, a deeper review of the effects of feedback on student learning, and the use of alternative rubrics for improved student performance.

Additional instructional treatments should be examined, such as peer learning using asynchronous discussion methods. According to Smith (2009), when students are able to question concepts with their peers, the percentage of correct answers typically increases due to gains in understanding through discussion. Asynchronous learning is a student-centered teaching method based on constructivist theory used to facilitate on-line learning. A combination of both asynchronous learning techniques and in-classroom experiences may be optimal for learning and should be explored. While the immediacy of in-class discussion has its benefits, asynchronous learning allows students to refine their thoughts on their own time which may lead to deeper understanding. Further research in the area of feedback may be beneficial. This study indicates that feedback is an important component of learning; however, it does not indicate the impacts of positive and negative feedback. Research on this topic would assist educators in providing the proper feedback to guide student learning. Feedback research to determine the level of detail necessary for the feedback to be effective may prove valuable. General feedback such as “good work” may have a different impact on student performance as opposed to feedback like “good work, I specifically liked your use of critical thinking, however, I would like to see an improvement in your work related to your spelling and grammar skills.”
Investigation of other types of rubrics may be useful. Student-learning effectiveness can be more appropriately measured and value-added strategies considered to improve knowledge transfer. Generally, there are two types of rubrics: analytical and developmental. Analytic rubrics describe domains of performance separately, have limited descriptors for each attribute and allow for specific feedback. Developmental rubrics describe the development of a process, such as writing, reading, or problem solving. Developmental rubrics are used by educators to make instructional decisions. There are two ways to use rubrics. Generic rubrics are written to be used with more than one task and can cross genres. Task specific rubrics are written for specific classroom assignments using language that connects the rubric to the task.

Limitations of the current study guide several recommendations for future research. First, since the quantitative data collected in this study were anonymous, additional research may provide more detail about how age, race, cultural background, ethnicity, and gender may interact with the various instructional treatments in affecting reflective practice. Secondly, further qualitative research may be explored to enhance understanding of student learning. Research methods utilizing student interviews or focus groups may allow deeper probing on an individualized or small group basis. Field notes in group classroom sessions may describe student emotions, observations, and reactions to specific instructional methods. The qualitative process may display emerging themes among participants and may alter original interpretations. This study concentrated on College of Business Administration freshmen only; other disciplines such as science, music, or education majors may have differing thinking skill scores. Additionally, a longitudinal study is important to determine student skill growth over time. Further research may benefit from measuring behaviors and attitudes, not just the utilization of
rubrics to score reflection performance. In addition, there was no measure of learning styles as compared to instructional methods.
REFERENCES


Gardner, A., & Willey, K. (2010), Does pre-feedback self reflection improve student engagement, learning outcomes and tutor facilitation of group feedback sessions? The Higher Education Academy Engineering Subject Centre, University of Technology, Sydney and the University of Sydney.


Available at http://nsse.iub.edu/NSSE_2006_Annual_Report/.


Wagner, T. (2010). *The global achievement gap: Why even our best schools don’t teach the new survival skills our children need—and what we can do about it*. Available at http://www.tonywagner.com/resources/the-global-achievement-gap


Available at http://apbrwww5.apsu.edu/SRATE/JournalEditions/191/Meece.pdf


APPENDIX A

*PowerPoint Tutorial*

Reflection about Learning in the College Classroom

Part 1: What do we mean by reflection?

Think about the two most common meanings of the word.

One is to think, ponder, or meditate.

The other is an image cast back by a still surface like a pond or solid surface like a mirror.

When we talk about reflection in the college classroom, we are incorporating both meanings.

**Thinking:**

We mean first of all that students should spend time in deep thought about their own learning. They should think about **what** they have learned, **how** they have learned it, and the **connections** that exist between prior knowledge and new knowledge, between information learned in different classes, and between learning inside and outside of class.

**Seeing yourself:**

We also mean that students need to look at themselves critically as students. To look in the mirror to understand themselves as learners and to be critically aware of both what they already know and what they still need to know. A college education is a **process of** personal transformation from being a newcomer or novice in a particular field (such as business, or sociology, or chemistry) to becoming an expert, someone who has a thorough grasp of the field. Becoming an expert, however, does not mean that you stop learning; it only means that you know enough to continue learning as your field grows, expands, and develops. True experts
know that learning never stops. That’s why you can be a novice, but can only be in the process of becoming an expert.

So let’s take a look at a student who has been asked to do each kind of reflection. First, LaKeisha has been asked to write a reflective essay in which she makes connections between two classes she took last term. She chooses PSY 1010 and CHEM 1000.

LaKeisha: Well, both classes were for first-year students. [Klaxon]

Narrator enters: C’mon LaKeisha, You can do better than that. You need to think hard, to think outside the box, to think creatively about connections that are neither obvious nor trivial.

L: Both classes were sort of sciency. [Klaxon]

N: Really? You can do better than that.

L: Both classes were challenging and interesting [2 Klaxons]

N: Cliched! Boring!

L: Ok, ok. How about this? One thing I learned in PSYC is that a lot of mental illnesses aren’t really mental at all. They have to do with chemicals in the brain. And my chemistry class taught me about how chemical reactions occur and what kinds of effects chemical reactions can have. So there really are a lot of important ways in which these classes helped me understand big picture connection. [Applause]

N: Now you are on the right track. You’ve discovered something incredibly important about the whole process of education. It’s all a matter of learning to see those connections. They’re all over the place, but you have to learn to see them and be able to talk and write about them. That’s what it means to be educated.
Later, LaKiesha is asked to do the second kind of reflection; to write a critically reflective essay about gaps in her knowledge of a particular subject area.

L: Well, I don’t want to hear that stupid horn again. So let’s see. [Thinks.] Even though I know that there are chemical reactions in the brain, I really don’t understand how they work. Do the chemicals just float around inside the brain? Are they located in particular areas in the brain? How do they get into the brain? Do they move around? How do they get from place to place? Wow! There really is a lot I don’t understand. [Applause]

N: Great work. Your job now is to find out the answers to these questions if you really want to move from being a novice to being an expert.

L: So it’s not enough just to ask the questions? [Klaxon]

EXERCISES:

1. Write a brief reflective essay on the connections you have discovered between (any two courses? Specify courses?)

2. Write a brief reflective essay on what you have learned so far in this class and what you think you still need to learn more about.

**Part II: How Can Students Learn to Reflect?**

One of the most important ways to learn about reflection is to understand the **crucial elements** of a good reflection.

- A good reflection shows evidence of **serious thinking and questioning**. It is not superficial or clichéd. If you haven’t worked hard and thought hard, you probably haven’t done a good reflection.

- A good reflection requires **self-awareness and honesty**. If you are writing what you think others want to hear, you are selling yourself short and losing an opportunity to learn
more about yourself and about the subject matter. Your instructor wants your reflection not one that could have been written by anyone.

• A good reflection is full of concrete and specific examples. One of the most prevalent problems with student reflections is that they tend to be vague and abstract. “The course was interesting.” “I learned a lot.” “If I had to do it again, I’d study more.” While all of these statements are doubtless true, they don’t tell the reader very much and don’t require a lot of thinking or awareness on the part of the student. If the reader can’t see you as a distinct individual in what you have written, then you haven’t done a good job with your reflection. It should sound like no one else’s.

• A good reflection is thorough. Especially if the reflection is in response to questions posed by the instructor, it is crucial to answer all the questions, not just some. A good reflection covers all the bases and show evidence of thinking that is both deep and wide.

• A good reflection is well organized and correct in terms of grammar and mechanics.

• A good reflection shows the ability to synthesize—that is, to pull lots of different ideas together, to show the relationships between concepts, prior and new knowledge, classroom, and co-curricular work.

• A good reflection shows the ability to analyze—that is, to break ideas down into their component parts and put them together again in new ways.

Let’s look at the two sample reflections from students who were assigned to watch a play and then reflect on their experience:

Reflection A: I really enjoyed the play. It was well-acted and the costumes were very authentic looking and cool, sometimes I didn’t understand everything the actors were saying but mostly I did. I’m not familiar with ancient plays like Shakespeare but was pleasantly surprised because I
didn’t expect to like it and I did, mostly. The play was pretty long and parts of it were unrealistic but of course it’s a classic and there’s a good reason for that. I was kind of surprised by the scenery because there wasn’t very much of it and the stage was pretty bare. Hamlet is a pretty sad play and a lot of people die—in fact almost everyone dies—the girl, and Hamlet, and his mother and uncle, and the old man, and the girl’s brother. So there was a lot of stabbing and stuff. I never really understood why Hamlet acted so weird.

Reflection B: I know Hamlet is a famous Shakespearean play, but I had never read it before or seen it acted, so I was confused at first. The language was English, of course, but the actors spoke very quickly and there were a lot of words and expressions that I did not understand because of when the play was written. But I tried very hard to follow what was going on, and as the play progressed, I found that I was able to understand better. Sometimes the actions helped me understand the words. There was a scene where Hamlet was talking to some actors and I could understand by his actions more than his words that he didn’t want them to overact.

I was surprised by the scenery. I expected something very realistic with a castle and royal chambers and that sort of thing, but the scenery was very plain and there weren’t even any curtains, so when the scenery changed, the audience could see the stage crew move things around. At first I found this annoying, but after a while I began to notice that I paid more attention to the actors and the language without the distraction of the scenery.

The play is called a tragedy, and it is obvious why. Almost everyone dies at the end. But more than that I felt the tragedy was in the great was of Hamlet’s life. He seemed so passionate, and smart, and even funny, and yet he was obsessed with revenge and seemed almost to be driven to die. That was fascinating and frightening at the same time.
I think the next time I go to see a play that was written long ago, I will want to read the play first. I think that will help me understand the dialogue better and enjoy the play more.

EXERCISE: Which is the better reflection? Using the list of characteristics above, list the specific differences between the two reflections to support your answer.

Another important way to learn to reflect is to practice. Even if your instructors don’t specifically ask you to reflect on your learning, you should anyway. Every time you do a paper or major assignment, think about your own learning. Always be aware of the possibility of connections between and among your classes. “What am I learning in sociology that relates to what I am learning in business?” “How will this course in literature help me to be a better manager someday?”

Your instructor may help you in the reflection process by giving you specific questions to answer about an assignment. If he or she does not, here are some good questions you can ask yourself:

- What exactly did I learn?
- How have I changed as a result of this experience?
- How did I go about making sense of the information/situation?
- What parts of the experience were the most/least valuable and why?
- How does what I learned relate to what I already knew about the concept?
- How does what I learned relate to my other classes?
- How does what I learned relate to my co-curricular activities?
- How does what I learned relate to me as a person?
- What specific skills have I practiced/perfected in completing this assignment?
- What specific skills do I need to develop to do an even better job next time?
- What more do I need to learn about the subject/topic/concept?
Another important aspect of leaning to reflect is **feedback** from your instructors or peers. Other people can sometimes help you see your own learning or progress even if you don’t, so feedback is essential to writing better and better reflections.

**Part III: Mind Games**

Thinking is a multifaceted skill; that is, it is made up of various other skills. This is just a brief list of some of the thinking skills you will use as you reflect on your learning:

- Comparing
- Contrasting
- Classifying
- Analyzing
- Elaborating
- Evaluating
- Synthesizing
- Creating

**EXERCISE:**

Look up a definition of each of these skills, and write the definition.

**Compare:**

**Contrast:**

**Classify:**

**Analyze:**

**Elaborate:**

**Synthesize:**

**Create:**
EXERCISE:

Let’s practice some of these skills. We’ll take a subject that you are familiar with: your own extended family. You can include your parents, brothers and sisters, grandparents, aunts, uncles, cousins—as long as you end up with a group of between 15 and 25 individuals. Pay attention to how your mind is working WHILE you are doing these tasks.

1. Compare and contrast: Going beyond superficial characteristics (like height, weight, hair color), list five ways in which many of the members of your family are similar and five ways in which they tend to differ.

2. Classify: Select a category and classify your family members with respect to it. For example, you might look at years of education. Create a graph or chart to represent your categorization. (Again, try to stay away from the obvious.)

3. Analyze: While you might think of your extended family as a unit, you know that there are a number of different relationships among all the individuals. Perform an analysis of the communication dynamics within your family. Who communicates with whom? How often? What is the nature of the communication? You can include Facebook, Twitter, phone, mail, email, holiday and birthday greetings, face-to-face encounters, weddings and funerals only, and so on. Is the communication verbal, non-verbal, positive, negative? Create a visual and/or written representation of these various relationships.

4. Elaborate: Choose one of the communication relationships you identified in the previous step. Provide more details and examples to give your audience a deeper and more accurate picture of the relationship. Provide at least seven additional details.
5. Synthesize: Pull all this disparate information together to make an overall description of your family. Write a 150-250 word description of your family based on your thinking thus far.

6. Create: Design a family crest. You may either draw the crest with brief note explaining each element or you may write out the entire description.

7. Reflect on this experience. Which of these tasks was easy? Why? Which was hard? Why? What did you notice about your thinking processes? Some people are better at breaking things apart (analysis); some are better at bringing things together (synthesis). Which would you say you were better at?

Add a group element—offer to faculty. Display crests?

Part IV: Why Should Students Learn to Reflect?

Some educators believe that you have not really learned anything until you have reflected on it—until you have thought about both the topic or concept and your own mental/learning processes. If you stop to think about it, things happen to us all the time but we usually don’t stop and ask ourselves, “Hey, what just happened here?” unless we run into major problems. But that “Hey, what just happened here” attitude should be a daily question. “What did I just do?” “What did I just learn?” “How does this connect with something I already knew?”

Harvard psychologist Ellen Langer has done a great deal of study of what she calls “mindfulness.” She has found that simply paying more attention to everything we do, being more open-minded, and being willing to re-categorize our experiences (i.e., make new and different connections) are hugely important to our mental and physical well-being. She suggests that learning to pay deliberate attention (to reflect upon) what is happening around us, what we are doing, and what we are thinking makes us more effective in every aspect of our lives.
Thus, as you begin to understand how you learn, what you know, and what you need to know, you become a better student. In addition, you are preparing yourself to give great answers to the kinds of questions that often come up in job interviews. Many young people looking for their first jobs are not very good at saying what they have learned, what they know, what skills they have, and how they have successfully applied those skills. However, students who have reflected on their learning have no problem answering the question, “What can you contribute to the success of this organization?”

In addition, reflection helps you prepare yourself for a lifetime of learning new things—a crucial skill for the 21st century. More and more, people are finding they must change careers several times during their lives, and only those who are skilled learners—and can articulate their skills and their ability to learn—succeed in making necessary career transitions.

EXERCISE: Write a brief reflection on what you learned through the process of going through this unit. Be prepared to share your reflection with other students in the class.
Welcome to BA 1100! This First Year Business Experience Course enrolls first year students in the College of Business. It is the first course in a series of four applied experience courses in the BSBA degree. The series provides you with opportunities to learn how to integrate the knowledge and skills learned in other BSBA courses.

BA 1100 is a lab course that will build on what you learned last semester in BA 1500. The class is made up of hands on learning experiences. You will study a product, a business, and its customers to build your knowledge and understanding of how businesses deliver customer value. The class also will help you identify the types of organizations you want to work for in the future. You will also be able to go into interviews better prepared than the competition to ask intelligent questions about the business and how it delivers value. You will not find another business program that provides this opportunity for deep, lasting, experiential learning.

Our final destination is a project presentation in which you demonstrate that you have learned how to identify customer, product, and company insights, why they are important, and how insights lead to potential innovations. Labs will involve product dissections, methods for customer insight, and detecting a company’s competitive advantage. The labs will lead up to the final project documents and presentation.

Course Materials

Required materials: obtain a 1.5 or 2 inch 3-ring binder in which you should accumulate all handouts, exercises, completed assignments, and other materials for the course. This binder will become your portfolio for the course.

Other items:
- Check your email messages and MyBGSU daily for any messages or announcements
- Additional course information will be available on MyBGSU under My Courses
General Outline of BA 1100

**Weeks 1-8: Gaining Customer Insight**—Learn how to understand and document understanding of customers; who they are, why they buy, the value they seek, unmet needs. Work in teams, play different roles—consumer, observer, interviewer. Each student team selects a branded product to work with for the rest of the semester (about week 4).

**Weeks 9-11: Gaining Product Insight** – dissect the branded product to understand its value; investigate how it compares to competing brands.

**Weeks 12-15: Gaining Business Insight** – research the business to learn how it produces value; identify its value proposition for the product you are studying.

**Final Project:** Presentation about product under study. Each team member identifies at least one customer, product, or company insight learned; team identifies an unmet need (an opportunity to create value) and proposes an innovation based on insights gained.

**BA 1100 Learning Outcomes: What You Can Expect to Learn**

1. **Inquiry** – through hands on experience, you will learn how to investigate a product, its customers, and the business that produces it to deeply understand how customer value is created.
2. **Communication**—You will learn about and be expected to use basic templates and guidelines for professional reports, assignments, and emails. You also will get to practice presenting as part of a team.
3. **Participation and Leadership**—You will be engaged in activities that help you learn more about a product and its customers to help you develop leadership competencies. Also, you will be working on becoming better at collaborating with a group.
4. **Personal and Social Responsibility**—You will learn about some of the ethical questions that arise in business. You will have many chances to demonstrate college level learning skills. You will develop skills that will help you prepare for internship and job interviews.
5. **Innovative Thinking**—You will learn methods of opportunity recognition that lead to innovation.
6. **Business Knowledge**—You will demonstrate your understanding of why customer value is the central concept of the BSBA Framework (circle or “pie” model), by demonstrating insight into how your product solves the customer’s problems and provides the value they are seeking.
7. **Collect Evidence of Learning for Your Portfolio**—You will collect evidence of your progress on the learning outcomes to date.
BA 1100 Grade: How We Will Know What You Have Learned

Your grade reflects how well you demonstrate what you have learned, not how hard you have worked (although the two obviously are related). We make every effort in BA 1100 to give you great teaching and coaching and the course grade has a variety of graded items so you can do your best. But ultimately, the grade is about how well you have learned and how well you have demonstrated that learning.

<table>
<thead>
<tr>
<th>Grade Component</th>
<th>Percent*</th>
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<tbody>
<tr>
<td>Individual Weekly Assignments</td>
<td>50%</td>
</tr>
<tr>
<td>Project: assignments, final paper, final presentation</td>
<td>40%</td>
</tr>
<tr>
<td>Participation and completion activities (includes lab portfolio)</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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Grade Components Explained

A = 90.0% - 100%
B = 80.0% - 89.9%
C = 70.0% - 79.9%
D = 60.0% - 69.9%
F = Less than 60.0%

Individual weekly assignments—most weeks there will be at least one graded assignment that you complete individually. Assignments include such things as reading, viewing videos, collecting information.

Project—will be done in a team of five students. Your team will select a brand from a pre-approved list of consumer products. You will spend the semester studying and analyzing the product, its customers, and the company that produces it with the goal of identifying insights that lead to a potential product innovation. The project will develop your understanding of business and how it works. It also will help you learn how to research a company that you might be interested in working for, or with whom you have an internship or job interview.

Participation and completion activities—there will be assignments, such as submitting your lab portfolio or attending speaker events that will be graded for completion.

Miscellaneous Points-- are reserved for additional learning opportunities that may come up during the semester.

Total Points—as the semester emerges, we may need to adjust the percent of points dedicated to a component in order to best meet students’ learning needs.
Quiz and lab exercise points can only be earned when you are in class at that time. There are no make-up labs or quizzes. Homework is to be handed in during the class that it is due. Email submissions are not accepted.

You **must** achieve the level in order to **earn** the corresponding grade. There is **no** “rounding up” or “extra credit” or “curve” offered.

If someone develops a long-term, **documented illness** that prevents them from regularly attending class, please contact me.

**What You Can Expect of Your Instructor and Teaching Assistant**

Both your instructor and TA will hold office hours to help you; a great way to comprehend material that you are unsure about is to meet one-on-one. We’re here to coach you, answer your questions, and do whatever is in our power to assist. However, we are not here to hold your hand or do the work for you.

We promise prompt feedback, fairness, and responses to your questions and emails. If we don’t know the answer we will find it or direct you to where you can find it.

**What We Expect of You**

**Class attendance**
Class attendance is not optional. I’ve observed a direct correlation between attendance and performance. It’s in your best interest to establish this predictor of success early in your college career. As Gene Poor described in opening weekend, you’re cost is $50 per class per day. Would you buy a concert ticket and not attend the concert?

**Lateness Policy**
Manager
Your TA is managing the entire assignment collection process.

**Due Dates**
TA will collect assignments, during class, on its due date for student to receive credit.
There is no credit for late submissions.

**Conflicts**
If you are unable to attend class on a day an assignment is due, for whatever reason, it is student’s responsibility to have it delivered to your TA before or during the class which it is due. Your TA has an office in the BA building (see the first page of this syllabus for the office number) and a mailbox in the Department of Marketing, room 234 Business Administration.

When schedule conflicts arise such as commitments to family, university, military, sports, job or other situations, it is the student’s responsibility to **proactively** contact TA to make arrangements for submitting assignments on its due date.
For assignments which require students to attend an out of class event (ex: speaker, etc.) and one of the above situations arise, TA will develop an alternate assignment. Student must make an alternative assignment arrangement before the event to be eligible for this exception.

Long Term
If a student develops an illness which requires missing more than one class, also please advise your instructor of you situation.

Professional correspondence
I welcome emails with your questions and comments. It’s also a good habit to check with your TA to answer quick questions about the course. When you send an email, please identify the course, BA 1100, and the day and time our class meets to assist in facilitating a response.

Academic Honesty and Integrity
Students are expected to abide by the Codes of Conduct established by the University. Violations of the academic honesty code are very serious. Plagiarism, which the Student Handbook states is taking “the words or ideas of another as one’s own in any academic exercise” will result in severe penalties. This includes assignments that are worded similarly but may have a few words changed in each sentence. All assignments should be individual efforts, unless otherwise stated by your instructor. So, don’t copy someone else’s work. The Academic Honesty Policy details can be found at: http://www.bgsu.edu/offices/sa/studentdiscipline/. There you’ll find a link to a tutorial at the bottom of the page, or you can go to the tutorial directly via: http://www.bgsu.edu/media/video/tech/52322.html.

Students turning in individual assignments that look like they collaborated on these assignments or the assignments are virtually the same will be assessed severe consequences. There is also an obligation to file a formal report of all students involved in plagiarism with the Office of Student Affairs. It’s better to receive a zero on the assignment than to have it become part of your permanent record.

Withdraw Policy
This course follows the university guidelines for withdrawing from a course. If a student chooses to withdraw from the course, a “W” or “WF” will be assigned, based upon student’s performance at that point in the course. An average score of less than 60% at the time of withdraw will receive a “WF”.

I. Accommodations for Students with Disabilities: Please speak to me privately during the first week of the semester if you have a documented disability which requires some modification of seating, testing, or other class requirements so that appropriate arrangements can be made.

Cell Phone Usage: Please get in the habit of silencing your cell phone before class starts.

Laptops: The use of laptop/notebook computers during class is encouraged as it relates to capturing and organizing your class notes and material. Please don’t abuse this privilege by displaying material on your screen that is not related to the course and may be a distraction to your classmates.