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THE LEARNING CURVE: THE THINKING AND LEARNING STYLES OF SELECTED STUDENT ATHLETES AT ROWAN UNIVERSITY AND THE IMPACT ON ACADEMIC ACHIEVEMENT

by
Robert Bullard

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts in Higher Education Administration
of
The Graduate School
at
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July 29, 2009

Approved by _____
Dr. Burton R. Sisco

Date Approved July 29, 2009

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ABSTRACT

Robert W. Bullard
THE LEARNING CURVE: THE THINKING AND LEARNING STYLES OF SELECTED STUDENT ATHLETES AT ROWAN UNIVERSITY AND THE IMPACT ON ACADEMIC ACHIEVEMENT
2008/09
Dr. Burton R. Sisco
Master of Arts in Higher Education Administration

This study was designed to determine if thinking and learning styles of selected student-athletes at Rowan University impact academic achievement. Ninety-six undergraduate student-athletes from Rowan University participated in the study completing both the *Inquiry Mode Questionnaire* (InQ) and the *Learning Connections Inventory* (LCI) to measure thinking and learning styles. The InQ consists of 18 statements which are followed by five possible endings in which respondents indicate the degree to which each statement is most like you (5) or least like you (1). The LCI is a 28 Likert item self-reporting instrument that allows the respondent to learn of their learning style. Student-athletes also completed a demographic page, included on which were the variables of gender, academic classification, major, sports participation, and grade point average. Findings from this study support previous research about thinking and learning styles, while expanding the knowledge base about thinking and learning styles and student-athletes. Significant correlations were found between thinking and learning styles and the following variables: gender, major, and sports participation.

ACKNOWLEDGMENTS

First of all, I would like to dedicate this work to my family. I could not have done this or even be in the position I am in today without the tireless work of my mother and father. I owe everything to them. Also, I could not forget my sisters, Laura and Courtney, who so lovingly over the years had the ability to keep me level headed. Their ongoing work to keep my ego in check should be duly noted.

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Moreover, special thanks should be given to all my friends who listened to my whine about the amount of work that I find myself doing nowadays. Special thanks to the CAP Center, Admissions, and Academic Success Center. Thanks to my roommates, Chuck Grinnell and Dave Brennan, and great friends who are too numerous to name.

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CHAPTER I

INTRODUCTION

Higher education has been extremely important in the development of the United States ever since the founding of Harvard College in 1636. A major component of higher education is the increasing presence of the student-athlete. Since the inception of the Intercollegiate Athletic Association of the United States (IAAUS) and later its successor the National Collegiate Athletic Association (NCAA), student-athletes have been juggling the lines between the world of academia and the playing fields of sports. Hildenbrand (2005) states, "...conflict of interest has been in higher education since athletics first became a fixture among colleges and universities in America" (p. 1).

While performing the balancing act, stereotypes and questions about the academic prowess of the student-athlete have long been raised. The idea of the dumb jock or the academically inept student-athlete has been synonymous with collegiate athletics for the last 50 years (Hildenbrand, 2005). Previous research studies have been conducted on the student-athlete and academic performance (Allen, 1999; Covell, 1999; Hildebrand, 2005), but these studies fail to show the importance of learning and thinking styles and academic achievement. Most of the research has focused on empirical evidence and the attitudes and perceptions of coaches, administrators, both academic and athletic, and college/university presidents (Fingers, 2005). This study incorporated previous studies,

but gave particular importance to the impact of learning and thinking styles on academic achievement of student-athletes (Ayaz, 1998; D. Miller, 2000).

Statement of the Problem

This study compared student-athletes thinking and learning styles in relation to academic achievement. Moreover, this study compared the findings between two different learning assessment tools, the *Inquiry Mode Questionnaire* and the *Learning Connections Inventory*. The problem within the research is the gap between student-athletes and learning and thinking styles. Many studies have been conducted examining student-athletes and many studies have been conducted examining the importance and validity of learning and thinking styles. Further gaps lie between the implications of what to do with the learning and thinking styles of student-athletes, and how this knowledge could further benefit student-athletes in both the academic and athletic settings. Additionally considered within this study were the student-athlete's academic status, sports played, gender, and academic major.

Purpose of the Study

The purpose of this study was to collect data to ascertain selected student-athletes' learning and thinking styles and discover if there is a relationship between the learning and thinking styles of student-athletes and academic achievement at Rowan University. From the data ascertained, relationships between the learning and thinking style assessments were studied to discover relationships between learning and thinking. Furthermore, the impact of these learning and thinking styles of the student-athletes on academic achievement was also examined.

Significance of the Problem

The findings may provide insight to not only students but also administrators to ascertain more information on how student-athletes think and learn, and what means would best facilitate the needs of the student-athlete. Besides administrators, it also allows coaches and other student-athletes to recognize thinking and learning styles, allowing coaches and other players the ability further aid student-athletes by facilitating learning in the classroom and in competition. Through this facilitation of learning and thinking styles, faculty and administrators can gain further understanding of motivation, and what motivates students to act, think, and learn in a particular manner.

Assumptions and Limitations

Although this study was conducted at Rowan University, a NCAA Division III institution, the scope of the survey is very limited. Two hundred student athletes participating in any of the 16 intercollegiate sports offered at Rowan University consisted of the randomly selected sample. Limitations also included the number of athletes returning surveys, which were low due to the constraints of the season of participation. Further limitations may also included student-athletes that were not in the season of participation, as it was harder to get into a contact with because they are not bound by the restrictions of sport participation. It was assumed that all participating student-athletes answered the surveys truthfully and to the best of their abilities. However, the surveys were taken individually with other survey completers in the same room, which could skew actual attitudes from personal belief due to social normalcy. Other assumptions included that coaches, administrators, and others associated with intercollegiate athletics

did not pressure student-athletes to answer in a certain manner. There is also the potential for researcher bias because of the researcher's affiliation with the Rowan University athletic department. Moreover, the researcher worked in the Academic Success Center and Career, Academic Planning Center, and in the Office of Student Activities which could further bias the researcher due to his interactions with student-athletes and applications of particular learning styles.

Operational Definitions

1. Athletics: Sponsored activities offered as varsity intercollegiate sports at Rowan University during 2008/2009 academic school year.

2. Attitudes: The perceptions and beliefs that are felt by student-athletes at Rowan University in relation to academics at Rowan University.

3. Bridge Learner: Learners who do not have any avoid patterns but also do not have any use first patterns according to the *Learning Connections Inventory* (Learning Connection Resources, 2004).

4. Coaches: The head administrator of each particular sport, excluding athletic directors and compliance officers, at Rowan University.

5. Dynamic Learner: Learners who have no less than one use first patters but no more than two use first patterns according to the *Learning Connections Inventory* (Learning Connection Resources, 2004).

6. Grade Point Average (G.P.A.): The scale in which academic performance is measured in collegiate settings incorporating grades and credits. For the purposes of this study, the G.P.A. scale endorsed by Rowan University was used.

7. Learning Style: Johnston (2006) defines learning styles as, "when they understand what kind of learning comes most naturally to them, learners can approach any learning task with more conscious intention and self-awareness. They also can come to recognize learning situations in which a learning pattern that they are not naturally inclined to employ would be useful--and, with the help of a teacher, develop greater facility with this pattern" (http://www.letmelearn.org/about/getting_started, ¶ 2).

8. Role Ambiguity: The vagueness and uncertainty of student-athletes as to what their role is at Rowan University; that of a student or that of an athlete.

9. Role Conflict: The conflict student-athletes incur between being an athlete and a student at Rowan University.

10. Strong Willed Learner: Learners who have three or more use first learning patterns according to the *Learning Connections Inventory* (Learning Connection Inventory, 2004).

11. Student-athlete: For this study, student-athletes included all participants of varsity intercollegiate athletics at Rowan University during the 2008/2009 academic year.

12. Study Hall: A period of time where students are gathered to study or complete work for class.

13. Thinking Style: InQ Educational Materials (2003) defines thinking style as the following, "how you gather and process information, how you use that information to make and act on decisions, even what kind of information you gravitate towards -- influences every action. It is the basic mental model that you use to explain the world, yourself, and others. If you understand thinking styles -- your own and others -- you can

then understand how to make the most of your interactions" (http://www.inq-hpa.com/about.htm, ¶ 2).

Research Questions

This study sought to address the following research questions:

1. What are the thinking and learning styles of selected student-athletes at Rowan University?
2. Is there a significant relationship between student-athletes' thinking and learning styles and the demographic variables of gender, academic major, sports participation, academic classification, and G.P.A.?
3. Is there a significant relationship between thinking and learning styles utilizing the *Inquiry Mode Questionnaire* and the *Learning Connections Inventory*?

Overview of the Study

Chapter II, provides a scholarly literature review of studies relating to the study. This chapter includes the progression of the student-athlete through the collegiate experience. First, learning and thinking styles are discussed, including Barbe, Swassing, and Malone's (1979) study and the *Swassing-Barbe Modality Index* (SBMI) and Kolb's (1984) Experimental Learning. Next, the *Learning Connections Inventory* (LCI) and *Inquiry Mode Questionnaire* (InQ) are explained. Thirdly, the transition from being a prospective student-athlete to a member of the collegiate community is observed along with the student-athlete's roles as student and athlete. Next, men and women are described as Division III student-athletes. Finally, the chapter presents studies that

examined student-athletes' thinking styles and how they affect decision making in academic settings.

Chapter III includes a detailed description of the methodology and procedures used in the study. Included is the following: a description of the context study and where it was conducted, a description of the population and sample, description of data gathering techniques and procedures, and a description of how the data were analyzed.

Chapter IV details the findings and results of the study. Data are presented in reference to the research questions posed in Chapter I.

Chapter V presents the major findings of the study are along with discussion, conclusions, and recommendations for practice and future research.

CHAPTER II

LITERATURE REVIEW

Introduction

The importance of academic support programs for student-athletes at the Division III level is imperative for the success of the student-athlete. However, in some cases, academic support services are not afforded to the Division III student athlete as they are their Division I and II counterparts (Allen, 1999; Robst & Keil, 2000; Stavisky, 1998). The interpretation of learning and thinking styles and metacognition may supplement existing means of academic advising for student-athletes (D. Miller, 2000).

Learning Styles

Barbe, Swassing, and Milone (1979) describe a learning process in which the learners would learn through the use of modalities. According to Barbe et al., modalities consist of any sensory channel in which an individual receives and retains information. These modalities are further divided into the processes of sensation, perception, and memory. Barbe et al. state, "Because these three processes are the essence of learning itself, the modalities can be called keys to learning" (p.1). The authors presented three differing approaches to the view of the modality for further understanding:

a) Modality as a fixed neurological characteristic.

b) Modality as a preference.

c) Modality as a measurable behavior.

Although Barbe et al. acknowledge that importance of heredity, modality preference considers all steps in the process from sensation to the individual's resultant behavior. However, modality strength is equated with functionality of each modality and not the preference of the modality.

Barbe et al. describe an instrument which would assess the modality-based theory along with specific applications to the instruction. The *Swassing-Barbe Modality Index* (SBMI) measured modality strengths through matching-to-sample task questions through the recognition of geometric shapes perceived through the visual, auditory, and kinesthetic modalities (D. Miller, 2000). If individuals' dominant modality is visual, they may stare into space or close their eyes to help them concentrate and remember visual images. Auditory learners may talk to themselves to remember items. Kinesthetic learners may use their hands to remember sequences and to delineate between visual items (Barbe et al.). Through the SBMI, learners and instructors have the ability break down learning modalities to best facilitate learning in students.

Kolb (1984) describes a learning inventory and theory on experimental learning. Kolb theorized that the process of experimental learning as four-stage cycle with adaptive learning styles: Active Experimentation, doing, (AE), Concrete Experience, feeling, (CE), Reflective Observation, watching, (RO), and Abstract Conceptualization, thinking, (AC). Within this model (Figure 2.1), concrete experience/abstract conceptualization and

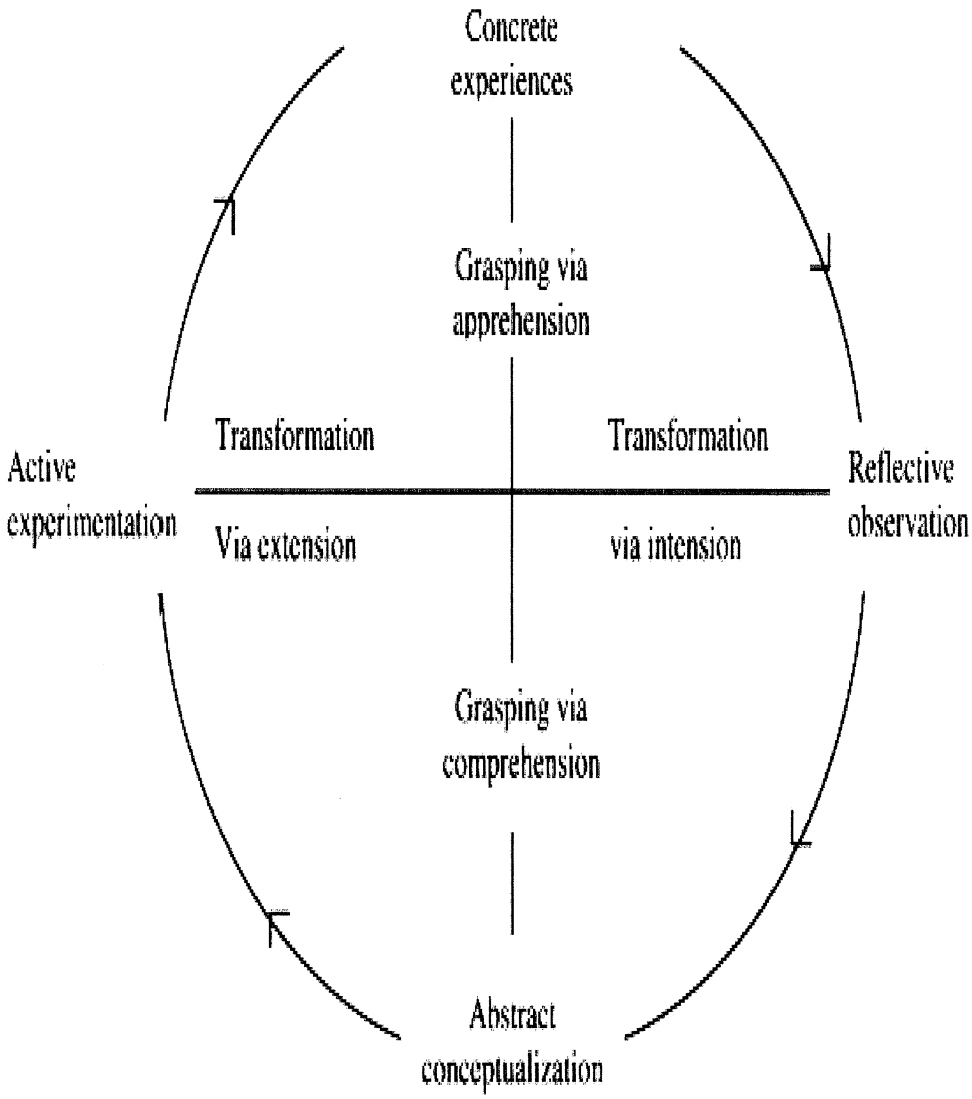

Figure 2.1. Kolb's (1984) Structural Dimensions Underlying the Process of Experiential Learning and the Resulting Basic Knowledge Forms (p. 42).

active experimentation/reflective observation are two distinct dimensions representing differing adaptive orientations. "The structural bases of the learning process lie in the transactions among these four adaptive modes and the way in which the adaptive dialects get resolved" (p.40).

To better assess individual orientations of learning, Kolb created the *Learning Style Inventory* (LSI). The development of the LSI was created through the guidance of four major design objectives:

a) The test should be constructed in way in which the test taker would respond to it as they would in a learning situation.

b) The inventory would be in a self-descriptive format.

c) The inventory should be constructed in the hopes it would prove valid.

d) The test should be straight forward and brief.

The final parameters of the LSI include a nine-item self description questionnaire. Each of the items asks the test taker to rank order four words according to which best describes personal learning styles with each of the words corresponding to one of the learning styles. The LSI measures a person's emphasis on each of the learning processes, AC, CE, RO, and AE from the test taker's rankings of words. Kolb describes an orientation toward Reflective Observation as focusing on the understanding the meaning of ideas and carefully describing these ideas. Concrete Experience focuses on being involved with immediate human situations in personal ways. Abstract Conceptualization focuses on using logic, ideas, and concepts. Active Experimentation focuses on actively influencing people and differing situations. Along with the learning orientations, the LSI provides

two combination scores which indicate the extent to which the test taker emphasizes abstractness over concreteness (AC-CE) and action over reflection (AE-RO).

James and Blank (1993) critiqued the learning-style instruments available for adults from the three major dimensions of information processing, perceptual modality, and personality. Along with the three dimensions, James and Blank examined evidence of validity, reliability, strength of the research base, cost, and overall usability of the instrument. The *Swassing-Barbe Modality Index* as an instrument was time consuming in measuring perceptual modalities, and was not designed for adults. The evidence of validity of the research base was found to be low or weak. Although the evidence of validity was low or weak, the evidence of reliability and the strength of the research were found to be moderate. However, the overall usability of the instrument was found to be low or weak. Kolb's (1984) *Learning Style Inventory* as an instrument that was widely used in measuring information processing was designed for adults. The evidence of validity of the research base was found to be low or weak. Although the evidence of validity was low or weak, the evidence of reliability and the strength of the research were found to be moderate. The overall usability of the instrument was found to be strong. James and Blank found that the data collected from these survey instruments should be used with great care due to inconclusive and conflicting nature of the evidence measuring validity and reliability. The data in result of the survey instrument should be used as potentially useful, but not as the end-all, be-all standard of information in the decision making process (James & Blank).

The Inquiry Mode Questionnaire & The Let Me Learn Process

Harrison & Bramson (1982) developed a learning system and instrument that identified five styles of thinking and learning. The InQ, the *Inquiry Mode Questionnaire*, was introduced in *The Art of Thinking*, based on inquiring modes. Inquiring modes are described as the basic sets of purposive methods for making sense for the world which are built on early acquired preferences, learned values, concepts of the nature of reality, and the views of the world (Harrison & Bramson, 1982). The theoretical framework for the InQ was developed from the work of Buchler (1961) and Churchman (1971) (Table 2.1).

Table 2.1

Harrison & Bramson's (1982) Table on the Theoretical Framework of the InQ

Style of Thinking	Churchman, Inquiry Mode ascribed to:	Central Idea	Buchler, Methodology ascribed to:	Central Idea
Synthesist	Hegel	Dialectic, Pheneomology	Whitehead	Process Philosophy
Idealist	Kant	Philosophical	S.T. Coleridge	Neoplatonic Transcedentalism
Pragmatist	E.A. Singer	Philosophical Idealism	Dewey	Pragmatism, Social Experiment
Analyst	Leibniz	Symbolic Logic	Descartes	Scientific Method
Realist	Locke	Empricism	Bentham	Utilitarianism

From the theoretical framework (Table 2.1), Harrison & Bramson (1982). identified five different styles of learning and thinking. The five learning styles include the Synthesist, Idealist, Pragmatist, Analyst, and Realist. InQ Educational Materials Inc. (2003), provide brief definitions of the five different learning styles.

- *Synthesists* - who focus their thinking on ideas and find connections among things that other people see as having little or no relationship -- their style is challenging, speculative, integrative, and process-oriented.
- *Idealists* - who experience reality as the whole into which new data are assimilated, based on perceived similarities to things they already know -- their style is assimilative, receptive, and need-oriented;
- *Pragmatists* - who perceive a world constantly changing and largely unpredictable, requiring a flexible, whatever-works approach to problem-solving -- their style is adaptive, incremental, and payoff-oriented;
- *Analysts* - who see the world as structured, organized, and predictable, who believe there should be one best method for doing anything -- their style is prescriptive and method-oriented; and
- *Realists* - who are inductive, whose mental modes are derived chiefly from observation and their own experiences -- their style is empirical and task-oriented.

The InQ consists of 18 statements which are followed by five possible endings. Of the five possible endings, respondents indicate the degree to which each statement is most like you (5) or least like you (1). After the completion of the InQ, scores are tabulated for each of the five learning styles of the InQ. If a respondent scored 60 or better in any of the learning styles, the learner has a moderate preference for that particular learning style. If a respondent has a moderate preference to a learning style, it is most likely the respondent will use the learning styles in everyday situations. If a

respondent scores a 66 or better in any of the learning styles, the learner has a strong preference for the learning style. If the respondent has a strong preference for a learning style, it is common for the respondent to use the style consistently and in most situations. If a respondent scores a 72 or better in any of the learning styles, the learner has a very strong preference, or a commitment to the learning style. At this point, the learner uses this learning style in all situations, normally dismissing the other learning styles. In cases like this, the strength in the learning style becomes a liability sometimes incorporating the learning styles at inappropriate times. Conversely, if a respondent scores a 48 or lower in any of the learning style, the learner has a moderate disregard for that learning style. A score of 42 equates to a strong disregard for a learning style with a score of 36 equating to a neglect of the learning style. Similar to learners who have a commitment to a particular thinking style, learners who have a clear neglect to a thinking style sometimes will consciously decide to avoid the thinking style, even if the thinking style is best suited for the situation at hand (Harrison & Bramson).

Christine Johnson, a professor at Rowan University in Glassboro, New Jersey developed a learning system that allows learners to become more aware of personal learning structure. The *Let Me Learn* is an advanced learning system that provides learners with a means to articulate who they are as a learner, and then guides teachers in developing the learning environment necessary for students to employ their learning strategies. Through this new, advanced learning strategy, students are able to intensify and organize personal learning processes working in conjunction with professors and peers. Johnston's (2006) theoretical basis for the *Let Me Learn* learning system was born

out of the Interactive Learning Model (ILM) (Johnston, 1994) which "depicts the simultaneous interactions of cognition, conation, and affectation within mental processing as four synchronous patterns (sequence, precision, technical reasoning, and confluence)" (p.1).

The ILM represents the interactions of 12 circles and names of each of the interactions. The sequential interaction is the aspect of learning which craves the structure of the step-by-step pattern. Organization is paramount in this interaction, with assignments being completed from beginning to end with a clear and present plan. The precise interaction is the aspect of learning which needs detailed information that is accurately and precisely delivered with a emphasis on answers. With the emphasis on being precise, writing in this learning interaction is highly specific with a yearning for exact answers for exact questions. In this learning interaction, there is a continual quest for an ultimate truth. The technical reasoning interaction is the aspect of learning which would be best categorized as pragmatic learning. This aspect of learning is dominated by the functionality of processes which heavy emphasis on the hands-on nature of learning. The confluent interaction is the aspect of learning in which natural ways and means of learning are rejected. This learning aspect allows the learner to start a task without reading all the directions, taking risks in learning, and failing and to repeat the process (Johnston, 2006).

The Interactive Learning Model utilizes the *Learning Connections Inventory* (LCI) to test the theoretical assumptions of the IML. Johnston (2006) describes the LCI as a 28 Likert item self-reporting instrument that allows learners "to report the degree to

which they simultaneously use each of four learning processes" (p.2). Within the 28 Likert item questions, three questions allow for free form answers which enhance the dynamics of the *Learning Connections Inventory*. Each of the four patterns may be a use first, as needed or avoid pattern as demonstrated by the score on the Likert-scaled items of the LCI. When a learner scores between a 25 to 35, it is known as use first pattern and means that the learner would be drawn to that interaction to demonstrate learning. When a learner scores between an 18 to 24, it is known as an as needed pattern and means that the learner can access this interaction with little guidance, even though it may not be the learner's strongest interaction. When a learner scores from a 7 to 17, it is known as an avoid pattern and this interaction should be avoided to best facilitate learning (Johnston, 1998). *The Let Me Learn* process has grown out of the Interaction Learning Model and the *Learning Connections Inventory* which allows the leaner to build upon self-knowledge of the learners' learning processes revealed through the administration of the LCI. Although the LCI allows learners to discover learning processes, it does not pigeonhole the learner into a single quadrant of learning. Rather, the LCI emphasizes that the leaner use each of the interactive processes in vary degrees to determine the totality of the learning experience (Figure 2.2). In conjunction, the LCI differs from other personality, multiple intelligences, or learning style testing because it reveals the learner's interactive process which allows the learner to act on the findings of the LCI. Through the administration of LCI, both teacher and student benefit from the results. With the instructor being able to understand learning of the student, it better allows the teacher to facilitate the learning processes of the student (Johnston, 2006).

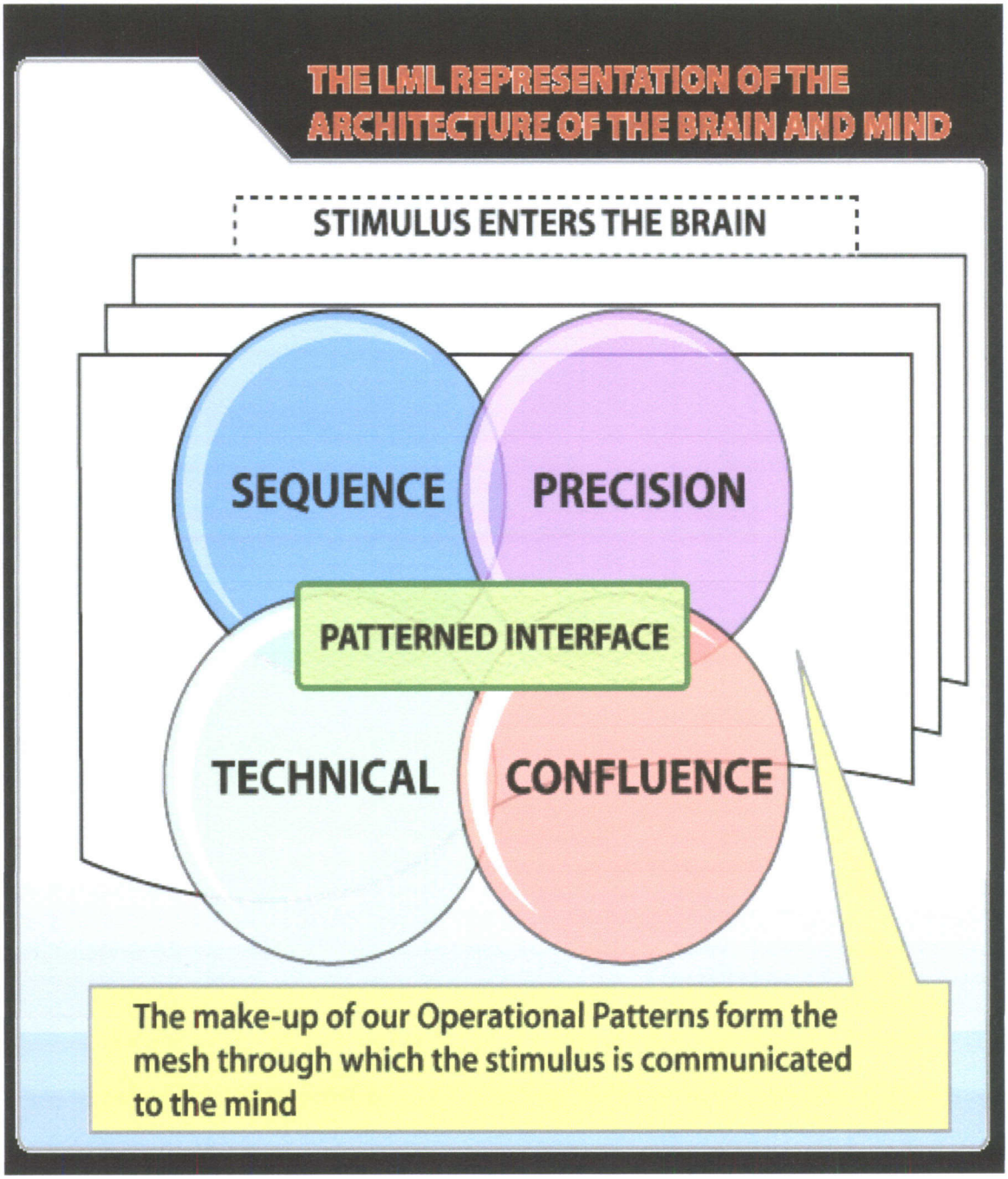

Figure 2.2. The Let Me Learn Process® from www.letmelearn.org

Learning Studies Using the InQ in Higher Education

Over the past 30 years, a number of research studies have focused on the learning styles of college students and social and academic interactions that occurred because of the college students' learning style. The initial purpose of the *Inquiry Mode Questionnaire* was not for use in higher education; however, the InQ has helped college administrators and faculty for over 20 years. In this section, research utilizing the InQ in higher education will be described along with strengths and weaknesses of the InQ.

Jones (2006) used the InQ to identify the thinking style preferences of female college and university presidents in relation to institutional control, highest academic degree earned, academic specialty and background, age, and total years of experience as a collegiate president. Through the data collected from the InQ, Jones established the thinking style profile of female college and university presidents. The thinking styles of Idealist and Analyst best described the respondents with 75% of them scoring high in at least one of the thinking styles. The thinking styles of Realist, Synthesist, and Pragmatist had a neutral preference, with the Synthesist being the least preferred thinking style of the respondents. Moreover, Jones found difference between leadership styles, institutional control, and thinking styles. Through the differences in thinking styles, cognitive processes of the collegiate presidents play an enormous role in how these women make decisions on a daily basis. "(Female collegiate presidents) can make their own comparisons to these current presidents in order to determine where they are in their own professional pursuits, and in what areas they need to focus or increase awareness" (p. 189).

Borlandoe (2004) completed a similar study utilizing the InQ to examine the thinking styles of women administrators working at community colleges in Pennsylvania,

Delaware, and New Jersey. Borlandoe divided subjects into three groups; one group of women currently employed as administrators at the community college level, the second group consisted of women who were formerly employed at a community college, and the third group consisted of the same characteristics of the first group. The first and second groups were given a questionnaire to complete while the third group participated in a focus group and did not complete the questionnaire. Borlandoe found the most common thinking style for women administrators at the community college level in the selected states was the Idealist and Analyst thinking styles. Although the author found distinct thinking styles associated within administrative positions in general, no correlation was found between different positions within administration and different thinking styles. Moreover, Borlandoe found a possible relationship between the Synthesist thinking style and upward mobility in the community college setting. This shift from the administrative side to the executive side may trigger new thinking styles that the administrator may have suppressed in previous roles.

Golian (1998) conducted a study to investigate the evidence of thinking style differences between senior level library administrators working in libraries through the implementation of the InQ. Through the implementation of the InQ, Golian discovered that female library administrators tended to use the Idealist thinking style while their male counterparts exuded characteristics of the Pragmatist and Idealist. Technical service library administrators tended to use the Idealist, Analyst, and Pragmatist thinking styles while their public service counterparts fell in line strongly with the Idealist thinking style. Moreover, Golian found the librarians participating in this study had preference for a flat

thinking style. In the flat thinking style, no one preference comes to the forefront with all five thinking styles at similar levels. From the summation of the findings of the InQ, Golian concluded that the gender, organization differentiation, non-diversified organization, team based management implementation all play a major role in thinking styles of selected librarians. Moreover, the study of librarians' thinking styles bridged a major gap of the lack of previous research linking thinking styles to librarianship. "...that this void in the professional library literature concerning the use of thinking style research had limited the implementation of this powerful self-awareness and administrative tool" (p. 187). Golian feels not only does more research need to be done on the field of thinking styles and librarianship, but also librarians must understand thinking styles to better personal, professional, and managerial development.

Learning Studies Using the LCI in Higher Education

Within the last 10 years, the LCI has become a more widely accepted instrument and has been used by researchers to better understand the powers of metacognition. In this section, research utilizing the LCI is described along with the strengths and weaknesses of the IML and LCI.

Newell, Dahm, Harvey and Newell (2004) examined the instrumentation of the LCI and the formation of teams among engineering majors in Junior/Senior Clinics class at Rowan University in Glassboro, New Jersey. In the formation of these engineering teams, students were to become metacognitive learners. To become metacognitive learners according to Newell et al., students "must understand their strengths and weaknesses in learning and control how they will approach a problem" (p.316).

However, engineering professors tend to perceive different learning styles and approaches as a lack of intelligence or motivation, when in reality the student's and professor's lack of awareness may be hindering academic progression. For example, when a team has predominately strong preference for one of the interaction, in this case sequence, but one member avoids sequences, the high-sequence members would view the other learner as lazy or a procrastinator. Conversely, the other members of the team who do not have the high sequence interaction would view the rest of the team as over bearing and up-tight. Newell et al. believe that recognizing the potential conflict could alleviate problems between learning interactions which could allow students and instructors to facilitate better learning. It appears that combining a students' awareness of a personal learning style and the learning styles of the students around them helps students identify strengths and weaknesses of each of the learning interactions. Through the realization of learning interactions, success in terms of both individual and team performance was heightened (Newell et al.). In this case, ignorance is far from bliss. With students becoming metacognitive learners, it allows students and instructors a means for further learning in individualistic and team settings in the classroom.

Marcellino (2006) completed research similar to Newell et al. (2004) by examining the formulation of teams of administrators in an educational leadership program. The basis for team selection was based on the use of the LCI. Administrators after the taking the LCI and being placed into teams reported a greater appreciation for not only personal learning interaction, but of the learning interactions of their fellow teammates. Furthermore, administrators realized strengths in their teammates which

further facilitate learning and results from the team. Marcellino found that the application of the LCI helped educational professionals increase personal learning and awareness of the learning of others. Marcellino states, "By focusing on a new category of learning differences as represented by the diversity in learning patterns, perhaps the 'old' categories of individual physical and cultural differences based on age, race, ethnicity or gender may be minimized or overridden" (p.15). The new metacognitive thinking goes beyond the physical classifications of learning and starts recognizing learning interactions through mental instrumentation rather than physical attributes.

In the summer of 2001, Peter Kressler, a professor of economics at Rowan University, contacted Christine Johnson about the possibility of enhancing the learning experiences of his economic students following the constraints of a 16 week course. Initially, Kressler (2002) explored the effects of heterogeneously grouped teams of American Economic History students based on personal learning interactions. After finding favorable results with the students of the American Economic History class, Dr. Kressler consulted with Dr. Johnston in expanding of students' awareness as learners in team settings. Kressler (2003) continued to study the nature of the communication and understanding of learners when coupled within teams with similar learning lexicons in undergraduate macro-economic classes. Kressler (2003) discovered outcomes that included students having the ability to "develop a lexicon of learning and to use their learning processes with intention" (p.4). Kressler believes that knowledge of the learning processes is the key to a student's overall success in learning. Through different subject matters, teaching specific techniques using the four interactions does make a

difference in the student's ability to grasp, understand, and learn new and challenging subject matter. Through the knowledge of learning interactions and processes by instructors, it further allows students to obtain metacognitive thinking of personal learning.

Jorgensen (2004) conducted a research study to further the metacognitive relationship between learner and instructor through the implementation of the Johnston's *Let Me Learn* process. Through the furthering of the metacognitive relationship, Jorgensen (2004) searched for a new found accountability discovered by students. Through this process of metacognitive discovery, the instructor has the ability to greater understand students learning interaction and decode assignments. Through the understanding of students, Jorgensen feels instructors can make connections to students through assignments that fall in line with results for the LCI and LML process. Having the student understand his/her learning interaction, puts accountability on the instructor and student to understand and facilitate different learning interactions. Jorgensen states, "If we are going to help students to take advantage of their use first patterns and to aid them in developing their as needed and avoid patterns, we must engage in intentional teaching" (p.20). Instructors should be self-critical of their teaching methods, assignments, and classroom demeanor to fully have students take accountability for personal learning interactions.

The *Let Me Learn* process has transcended the way learning and metacognition has been measured in higher education. Research has shown the new found awareness that the LML process promotes to both instructors and students (Johnston, 2006). With

instructors understanding students better, it facilitates more opportunities for learning. The major strength of the LML process is how it dually affects both student and instructor. Through the process, not only do teachers realize what type of learners they have in class but, realize personal teaching styles which impact students on a daily basis. Moreover, the LML process does not pigeonhole learners and instructors into one learning process. In the LML process, learners acquire the propensity of using all of the learning processes. For example, a learner can have two learning processes as "first choice learning processes," and two others learning processes as "as needed processes" (Jorgensen, 2004). The possibility of multiple learning processes can aid learners in understanding different topics through the use of the learning processes. Moreover, the LML process allows students and instructors to understand themselves through metacognition developed from the findings of the *Learning Connections Inventory* (Johnston, 2006).

The Division III Student-Athlete

The National Collegiate Athletic Association (NCAA) Division III classification is the largest division offered by the NCAA, with 443 members as of June 2007. The NCAA places priority on academics and the enhancement of student athletes as stated in the philosophy from NCAA.org (2007):

> Colleges and universities in Division III place highest priority on the overall quality of the educational experience and on the successful completion of all students' academic programs. They seek to establish and maintain an environment in which a student-athlete's athletics activities are conducted as an integral part of

the student-athlete's educational experience. They also seek to establish and maintain an environment that values cultural diversity and gender equity among their student-athletes and athletics staff. (p.2)

The Division III student-athlete has a very separate identity from their counterparts at Division I and II. Not only are they non-scholarship student-athletes, they also are provided with a better academic subculture than the student-athlete at the Division I and II levels (Allen, 1999; Stavisky, 1998). Allen (1999), stated that Division III coaches and student-athletes create positive academic subcultures, especially a greater sense of the academic subculture than Division I athletes. Emphasis of athletics as a professional career was very limited at the Division III level by coaches, which allowed the student-athlete to partake in more challenging academic opportunities. Stroll (1995), described the moral reasoning of the Division III student athletes not being adversely affected by competitive experiences of athletics. Stroll (1995), contends that the Division III athlete does not experience the same issues as the Division I athletes; scholarships, high coaching salaries, media attention, and tremendous athletic budgets. The fostering of the academic subculture takes professional athletic aspirations and recycles them into aspirations of successful careers, regardless of the academic major or field of study. Moreover, there was a clear exchange between the student-athlete and the institution of higher education.

Allen (1999), found that high school rank provides the only significant predictor of grade point average for Division III male student-athletes. Concurrently, student-athletes whose teammates selected a challenging major set lower academics than student-

athletes who selected easier majors. Moreover, student-athletes whose teammates emphasize the importance of receiving a college degree set higher academic standards than student-athletes who do not emphasize the importance of the college degree. Robst and Keil (2000), found that Division III athletes completed more credits per academic year and take harder class loads than non-athletes. Concurrently, Division III student-athletes graduated in less time than their non-athlete counterparts. Savitsky (1998) states that the Division III male athletes may not have the athletic pressures of Division I male athletics, they still succumb to athletics as the primary purpose of higher education. Concurrently, the Division III male athlete has more intrinsic academic motivation than counterparts from other divisions. Consequently, male student-athletes whose teammates foster a positive academic peer culture are more likely to have higher levels of academic involvement than student-athletes who do not receive such fostering (Allen, 1999). Allen (1999), concludes that teammates have a significant influence on a male student-athlete's level of academic involvement.

Stavisky (1998) states Division III student-athletes do not perceive negativity from professors at the same level as Division I athletes. Although they may not perceive negativity from faculty, Allen (1999) disagrees with Stavisky's contention about faculty relations. "Division III men may also be relatively more intimidated by faculty and support staff when they arrive at college because their coaches and teammates did not expose them to these individuals during the recruiting process" (pp. 194-195). This un-involvement of coaches and administrators in academics paves the way for behaviors which are to be practiced by student-athletes. The Division III student-athlete, especially

men, is more likely to skip class than their Division I counterparts, especially if the practice of skipping class is not frowned upon by other teammates (Allen, 1999).

Division III women student-athletes are somewhat different from their male counterparts in the same division. Allen (1999) argues that Division III women athletes have the most positive academic subculture, which originates from coaches and teammates. One obvious reason for this is lack of professional athletic opportunities for women, but Allen argues that external influences may affect female athletes' subculture.

> ...since the time spent with teammates (particularly with regard to travel and living situations) as a result of participation in Division III athletics is generally less than the time spent with teammates...it is very possible that Division III athletes develop influential peer relationships outside their athletic environment...these non-athletic peer groups may significantly influence academic outcomes, thus, deemphasizing the influence of athletic teammates for Division III women. (p.198)

Stavisky (1998) agrees with Allen's deduction of the decreased role of teammates on the Division III level stating that Division I female athletes showed more role conflict between being a student and athlete. He believes this can be equated to gender equality in collegiate sports over the last 20 years which now allows women's collegiate sports and women athletes to be caught up in the "big-time atmosphere" (p. 165).

Stavisky's (1998) notion of the "big-time atmosphere" questioned the time management and goal setting ability of student-athletes. If the student-athlete can learn to prioritize and focus on the important issues, he/she will be better able to eliminate

procrastination tendencies (Catron, 2005). Although critics examine the affects of athletic participation during the season of contest, student athletes are not in season all school year long, with further research being conducted to find any relationships between being in-season and out-of-season.

Evans (2000) found little to suggest that athletic participation hinders academic performance, nor does athletic participation enhance academic performance. Dickerson (2006) found similar results to Evans, where there were no significant correlations between in-season athletic participation and academic achievement. Dickerson found that the grade point average of student-athlete can be skewed due to the fact if a student-athletes' grade point average falls too low that they lose their status as a student-athlete. Similar results were found in athletes who were out of their traditional playing seasons as well. Wempe (2001) replicated a similar study to Evans and found that student-athlete's grade point average rose during the period of competition, which was directly proportional to the amount of credits they were taking. On the contrary, Adler & Adler (1985) refute that there is a positive relationship between athletic participation and academic progress. "As a result of their experiences at the University, athletes grew increasingly cynical about and uninterested in academics" (p. 248). They continue by stating that student-athletes accept their marginal roles in academia which is quickly followed by a lack of academic interest, effort, and goals. The detachment from the academic world for student-athletes is a direct result of athletic participation. Robst and Keil (2000) disagreed with the detachment from the academic world is a direct result of athletic participation. "It also points out that studies do not account for ability variables

are likely to link athletics and poor academic performance erroneously" (p.11). Ability scores are significant determinants of academic performance, and if athletes enter higher education with low scores and grade point average, it may cause lower grade point average; not athletics (Robst & Keil, 2000).

Student-athletes strongly support the notion that participation in intercollegiate athletics is an integral part of the educational experiences of student-athletes (Covell, 2005). "Given the necessary levels of involvement, combined with the institutional ethos and Division III limitations as to overall investment, these participants see intercollegiate athletics as an educationally beneficial experience" (p.111). In these cases for the Division III student-athlete, a college education facilitates an opportunity for these students to continue participation in athletics. Moreover, approximately 80% of student athletes surveyed felt the educational experiences gained through intercollegiate athletic competition cannot be acquired in other collegiate academic or extracurricular settings. P.S. Miller (2000) agrees with this summation, finding that student development was quite distinct. Student-athletes make a gradual shift from athletics to academics, with the overall process showing initial failure usually rebounding with successful results. Smith (2004) agrees with the basis of Miller's study, but believes it over-generalizes the student athlete experience. "For student athletes the realities of school and academic interest are often hampered by the context of school sport" (p.86). Accompanying athletic participation, time and athletic responsibilities can severely hamper a student-athletes' ability to perform in both the classroom and the playing. However, Covell (2005) stated that 68% of student-athletes do not feel that they are overly burdened by athletic

participation with approximately 20% of students feeling a burden from intercollegiate athletic participation. Bullard (2007) found similar findings with 77% of studied student-athletes feeling no conflict between athletic participation and academic performance with 83.4% of the student-athletes reporting they do not encounter lower expectation because of their participation in intercollegiate athletics.

Learning Styles and Student-Athletes

D. Miller (2000) conducted a study to determine and understand the interpretation of learning styles on student-athletes and feelings of self-perception of study orientation and academic empowerment and entitlement. Subjects were classified by the amount of the athletic scholarship that the student received. Students receiving any financial aid for athletics were classified as Group A and students receiving no financial aid for athletics were classified as Group B. Treatment and control groups were established with both groups being administered the *Productivity Environmental Preference Survey* (PEPS) by Dunn, Dunn, and Price and the SSHA Study Orientation Test. The members of the treatment group received individualized instruction which determined learning style preference and given a study plan in correlation with the results of the PEPS. The members of the control group completed the PEPS, but did not receive an individual instruction session. There was no significance between the members of the treatment group and the feelings of academic empowerment and study orientation. However, the treatment group showed change in scores on the SSHA Study Orientation Test in the fields of study habits, delay avoidance, and working methods. D. Miller (2000) argued

that the instrument, PEPS, may have been too amorphous, along with the representation of Boston College may have posed possible limitations in the study.

Ayaz (1998) conducted a study to determine if student athletes at an urban university experienced greater academic success based on supplemental multiple modalities sensitive instructional programs in the time span of one semester. Subjects were divided into two groups; a group of student athletes who participated in a supplemental multiple modalities sensitive instruction program and a control group of student athletes who received traditional instruction from the *Introduction to Academic Skills* at Florida Atlantic University. Subjects were selected from a summer program with 23 at-risk student athletes selected for the control group and 27 at-risk student athletes assigned to the treatment group receiving the special instructional programs. All subjects completed a demography survey with the treatment group completing the *Learning Styles Inventory*, LSI, and the Productivity *Environmental Preferences Survey*, PEPS. Through the administering of the learning inventories and daily program evaluations, the best teaching and learning techniques were devised to best facilitate learning for the student athletes of the treatment group. Ayaz (1998) concluded that the data indicated no correlation between student athletes who experience a supplemental multiple modality instruction program demonstrating higher second semester (fall) enrollment rates than student athletes who did not participate in a supplemental multiple modality instruction program. The data also indicated that student athletes who experience a supplemental multiple modality instruction program did not exhibit significantly greater academic success in terms of increased GPA than student athletes

who do not experience a supplemental multiple modality instruction program. Moreover, the data indicated no statistically significant difference for retention rates between student athletes who experienced a supplemental multiple modality instruction program and student athletes who did not experience a supplemental multiple modality instruction program.

Summary of the Literature Review

"Colleges and universities are, at the end of the day, academic institutions…there should never be a reason to apologize for looking closely at academic performance of athletes…" (Bowen & Levin, 2003, p.11). As universities and colleges continue to refine academic procedures and advisement for student-athletes, research on learning and thinking styles allows for individualizing instruction that meets the goals of providing effective academic services (D. Miller, 2000). Through research in the learning and thinking styles of student-athletes, it allows athletic and academic administration to further facilitate metacognitive learning, which places accountability for learning in the hands of the student-athlete.

Also, the enhancement of the student-athlete as a college student does not solely fall onto the student-athlete. Administrators, coaches, and faculty must all cooperate in fostering the facilitation of young student-athletes. Without such fostering, student-athletes may have significant difficulties maintaining and understanding learning and thinking styles, which may further confuse and impede on student development. The academic subculture of learning styles must be set forth by all facets of athletic department to truly aid student-athletes. Learning and thinking style diagnosis may be

one method that helps students make metacognitive transitions. However, students and instructors must have the knowledge of different cognitive styles to best utilize their benefits and to discover which learning activities will lead to productivity (Hiemstra & Sisco, 1990).

Research has shown that learning styles can be used in the classification of different groups in higher education, but is rarely used in the classification of student-athletes. Through prior research, the idea of the student-athlete has its own learning and thinking community has just recently been introduced. Although this research has provided limited support for learning style diagnosis and interpretation as viable method of academic measure, it has opened the doors for the enhancement of the research through clear and present direction (D. Miller, 2000). Thus, more research is needed to examine learning and thinking styles of student-athletes and the impact on academic achievement.

CHAPTER III

METHODOLOGY

Context of the Study

The study was conducted at Rowan University, in Glassboro, NJ. Rowan University is a NCAA Division III institution and is a member of the state funded colleges in New Jersey which include Rutgers, and satellite campuses, Ramapo University, and The College of New Jersey. Rowan University consists of six academic colleges with over 30 undergraduate majors, 20 master's concentrations, and a doctoral program in educational leadership. For intercollegiate athletics, Rowan University competes in the New Jersey Athletic Conference (NJAC) and offers 16 varsity sports; nine women sports and seven men sports. Of the 16 varsity sports offered at Rowan, all but one sport, Cross Country, have full time coaches, and at least one assistant coach. There are approximately 10,000 students that attend Rowan University with approximately 250 being male student-athletes and 180 being female student-athletes. The approximate 430 total student-athletes comprise 4.3% of the student population at Rowan University, with 2.5% males and 1.8% of females. The disparity in numbers between men and women student-athletes can be attributed to the sheer size of the football roster, 98, to any other sport, especially the female varsity sports. Moreover, some student-athletes at Rowan University participated in more than one sport, which

could also lead to a disparity of total of number of roster spots and the actual number of student-athletes.

All students at Rowan University, including student-athletes, have access to the *Learning Connections Inventory* through the Student Self-Serve System. The campus library has a myriad of information on learning and thinking styles for students and further assistance in the use of learning and thinking styles is available at the Career and Academic Planning (CAP) Center and the Academic Success Center. Moreover, most varsity teams require mandatory study hall for those student-athletes that coaches feel need extra work in the classroom.

Population and Sample Selection

The target population for this study was all student-athletes at NCAA Division III institutions during the 2008-2009 academic calendar year, namely spring 2009. The available population was all student-athletes at Rowan University, in Glassboro, NJ. A sample was selected consisting of 200 student-athletes at Rowan University using a proportional sampling method, from all of the varsity sports. Every intercollegiate sport at Rowan University would have at least one representative selected to participate in the study except Track & Field and Cross Country due to the crossover nature of the participation in these disciplines. The 200 student-athletes surveyed represents approximately 47% of the student-athletes and 2% of the total student population at Rowan University.

Instrumentation

The instruments utilized to assess student-athletes' learning and thinking styles were the *Learning Connections Inventory* (Johnston, 1998) (Appendix D) and the *Inquiry Mode Questionnaire* (Harrison & Bramson, 1982) (Appendix E). Johnston's (1998) *Let Me Learn* is an advanced learning system that provides learners with a means to articulate who they are as a learner, and then guides teachers in developing the learning environment necessary for students to employ their learning strategies with attention. Through this new, advanced learning strategy, students have the ability to intensify and organize personal learning processes working in conjunction with professors and peers. Johnston (2006) describes the LCI as a 28 Likert item self-reporting instrument that allows learners "to report the degree to which they simultaneously use each of four learning processes" (p.2). Within the 28 Likert item questions, three questions allow for free form answers which enhance the dynamics of the *Learning Connections Inventory*.

Harrison and Bramson (1982) developed a learning system and instrument that identified five styles of thinking and learning. The *Inquiry Mode Questionnaire* (InQ), introduced in *The Art of Thinking*, was based on inquiring modes. Inquiring modes are described as the basic sets of purposive methods for making sense for the world which are built on early acquired preferences, learned values, concepts of the nature of reality and the views of the world (Harrison & Bramson). From the theoretical framework, Harrison and Bramson identified five different styles of learning and thinking. The five learning styles include the Synthesist, Idealist, Pragmatist, Analyst, and Realist.

The instruments consist of two parts. Part I, Background Information, collected demographic information about the subjects (Appendix C). Part II consists of the LCI (Appendix D) and the InQ (Appendix E) used to evaluate the student-athletes' learning and thinking styles.

Following approval from the Institutional Review Board of Rowan University (Appendix A) a pilot test of survey was conducted with six former student-athletes; three of which graduated, two of which no longer have eligibility remaining to participate in intercollegiate athletics, and one who has chosen not to participate in intercollegiate sports any longer, but still has existing eligibility. These former student-athletes were given the survey to test its validity and reliability. None of the former student athletes reported any problems taking the demographic section of the survey (Appendix C) and finished the demographic section of the survey in less than three minutes. None of the former student athletes reported any problems with the administering of the *Inquiry Mode Questionnaire*, with all six completing this section of the survey in approximately 10 – 15 minutes. In regards to the *Learning Connections Inventory*, no former student-athlete expressed any problems with the log-in process and the administering of this portion of the survey. All former student-athletes completed this section in less than 10 minutes.

Data Collection

In order to conduct the survey with the student-athletes at Rowan University, each student was given a consent form for signature (Appendix B), to be involved in the study. The student-athletes were selected on the basis that they were on the roster of an intercollegiate sport at Rowan University. The background and demographic information

(Appendix C), *Learning Connections Inventory,* and the *Inquiry Mode Questionnaire* was administered in Spring of 2009. A statement of consent was delivered prior to any other surveys, serving as a consent form for the completion of the surveys. For teams participating in practice, which included spring practices for fall sports, surveys were distributed at the beginning or completion of practice. At this time, student-athletes were administered the background and demographic data and the *Inquiry Mode Questionnaire*. Following the completion of the InQ, student-athlete were explained the process of taking the *Learning Connections Inventory* on the internet through the Rowan University Student Self-Serve website. If student-athletes were not practicing, an individual meeting was arranged at a location away from their playing location. At the completion of the background and demographic information and the *Inquiry Mode Questionnaire*, the student-athletes were also administered information for the completion of the *Learning Connections Inventory* through the Rowan University Student Self Service Website. The background and demographic data and the *Inquiry Mode Questionnaire* were collected after the student-athlete was completed with each section. To ascertain the data from the *Learning Connections Inventory*, a data table was completed by the Let Me Learn organization with the results of the *Learning Connections Inventory* and returned via e-mail. No incentive was promised for the completion of surveys, however a promise by coaches and student-athletes was exuded for the completion of the surveys.

Data Analysis

The independent variables in this study included gender, academic classification, sports participation, G.P.A., and academic major. These independent variables were

collected on the background and demographic section of the survey (Appendix C). The dependent variables were the learning and thinking styles of the student-athletes, measured by the *Inquiry Mode Questionnaire* (Appendix D) and the *Learning Connections Inventory* (Appendix E). Various learning and thinking styles of student-athletes were explored based on the independent variables using the SPSS computer software. Data were analyzed using frequency tables. The impact of independent variables on the dependent variables was found through the application of SPSS. Correlations (Pearson's product-moment calculations) and descriptive statistics (mean, standard deviation, percentages) were used to examine the data that were collected through the survey.

CHAPTER IV

FINDINGS

Profile of the Sample

The subjects for this study were selected from the student-athletes at Rowan University of Glassboro, NJ in the Fall of 2008 and the Spring of 2009 to represent a proportional sample of student athletes from every sport excluding Track and Field and Cross Country. Of the 200 *Inquiry Mode Questionnaire* and the *Learning Connections Inventory* surveys distributed, 96 were returned, yielding a return rate of 48%. There were 65 females (67.7%) and 31 males (32.3%).

Table 4.1 contains demographic data on the academic classification of the student-athletes for the academic calendar year of 2008-2009. A majority of the student-athletes were upper classmen (68.7%), with only 31.3% of the respondents describing themselves as freshman. The largest two respondent groups of academic classification were freshman and sophomore (31.3%), which entails 62.6% of the respondent population.

Table 4.1

Academic Classification (N=96)

Academic Classification	Frequency	%
Freshman	30	31.3
Sophomore	30	31.3
Junior	25	26.0
Senior	11	11.5

Table 4.2 contains information on the grade point average (G.P.A.) of the respondents. Of the 96 respondents, 64 (66.7%) reported having a G.P.A. of a 3.0 or higher. More respondents reported having a G.P.A. of 3.5 – 3.74, 20 (20.8%), with a mean G.P.A. of 3.06 and a standard deviation of 1.835.

Table 4.2

Grade Point Average (N=96)

G.P.A	Frequency	%	G.P.A	Frequency	%
2.24 or lower	4	4.2	3.0 – 3.24	17	17.7
2.25 – 2.49	2	2.1	3.25 -3.49	18	18.8
2.5 – 2.74	13	13.5	3.5 – 3.74	20	20.8
2.75 – 2.99	13	13.5	3.75 or higher	9	9.4

Table 4.3 contains information on sport participation of the respondents. Swimming & Diving includes both the male and female swimming and diving teams.

Table 4.3

Sport Participation (N=96)

Sport Participation	Frequency	%
Baseball	13	13.5
Swimming & Diving	16	16.7
Lacrosse	15	15.6
Football	7	7.3
Field Hockey	13	13.5
Softball	13	13.5
Men's Soccer	5	5.2
Women's Soccer	12	12.5
Volleyball	1	1.0
Women's Basketball	1	1.0

Table 4.4 contains information on the academic major of the respondents. Of the 96 respondents, 28 (29.2%) were Health and Exercise Science majors, with the Law and Justice, Biological Sciences, and Undeclared majors being second most popular major

with nine respondents respectively. Respondents in these four majors entail 57.3% of all the respondents involved in this research study.

Table 4.4

Academic Major (N=96)

Academic Major	Frequency	%
Health/Exercise Science	28	29.2
Law/Justice	9	9.4
Biological Science	9	9.4
Undeclared	9	9.4
Marketing	5	5.2
Business Management	4	4.2
English/Early Elementary	4	4.2
History/Secondary Education	3	3.1
Finance	3	3.1
Early Education	3	3.1
Communications	3	3.1
American Studies	3	3.1
Civil Engineering	2	2.1
Public Relations	2	2.1
Accounting	1	1.0
Mechanical Engineering	1	1.0
Mathematics	1	1.0
Athletic Training	1	1.0
Radio/Television/Film	1	1.0
Psychology	1	1.0
Advertising	1	1.0
Mathematics & Science/Education	1	1.0
Management Information Systems	1	1.0

Analysis of the Data

Research Question 1: What are the thinking and learning styles of selected student-athletes at Rowan University?

Table 4.5 contains data on the thinking styles from the results of the *Inquiry Mode Questionnaire* that was administered to selected student athletes during the 2008/2009 academic school year at Rowan University.

Table 4.5

Thinking Styles of the Inquiry Mode Questionnaire (N=96)

Thinking Styles	Mean	Median	Standard Deviation
Synthesist	48.27	48.00	7.446
Idealist	55.98	56.00	6.146
Pragmatist	54.99	55.00	7.274
Analyst	56.21	55.00	7.037
Realist	54.55	55.00	5.498

A look at the responses dealing with the thinking and learning styles of student athletes yielded a variety of responses. In regards to the *Inquiry Mode Questionnaire*, (Table 4.6) Synthesist scored a mean score of 48.27, with a standard deviation of 7.446. The most frequent score of the respondents was 53, with the range of scores between 49 – 53 accounting for 29.2% of all scores. The lowest score in the Synthesist range was 31, with the highest score equaling 68.

Table 4.6

Inquiry Mode Questionnaire Synthesist (N=96)

Score	Frequency	%	Score	Frequency	%
31	1	1.0	50	6	6.3
34	1	1.0	51	6	6.3
35	1	1.0	52	4	4.2
36	1	1.0	53	8	8.3
37	3	3.1	54	1	1.0
39	3	3.1	55	3	3.1
40	4	4.2	56	1	1.0
41	4	4.2	57	1	1.0
42	5	5.2	58	5	5.2
43	6	6.3	59	1	1.0
44	4	4.2	61	1	1.0
45	5	5.2	62	3	3.1
46	2	2.1	63	1	1.0
47	5	5.2	65	1	1.0
48	4	4.2	68	1	1.0
49	4	4.2			

In regards to the Idealist (Table 4.7), the idealist category scored a mean score of 55.98, with a standard deviation of 6.146. The most frequent score of the respondents were 52 and 58, with the range of scores between 52 – 58 accounting for 47.9% of all scores. The lowest score in the Idealist range was 36, with the highest score equaling 71.

Table 4.7

Inquiry Mode Questionnaire Idealist (N=96)

Score	Frequency	%	Score	Frequency	%
36	1	1.0	58	9	9.4
44	2	2.1	59	2	2.1
45	1	1.0	60	5	5.2
47	1	1.0	61	4	4.2
48	4	4.2	62	3	3.1
49	4	4.2	63	4	4.2
50	3	3.1	64	3	3.1
51	5	5.2	65	1	1.0
52	9	9.4	66	2	2.1
53	5	5.2	67	2	2.1
54	6	6.3	68	1	1.0
55	3	3.1	69	1	1.0
56	8	8.3	71	1	1.0
57	6	6.3			

In regards to the Pragmatist (Table 4.8), the Pragmatist category scored a mean of 54.99, with a standard deviation of 7.274. The most frequent score was 54, with the range of scores between 52 - 56 accounting for 27.1%of all the pragmatist scores respectively. The lowest score in the Pragmatist range was 34, with the highest score equaling 71.

Table 4.8

Inquiry Mode Questionnaire Pragmatist (N=96)

Score	Frequency	%	Score	Frequency	%
34	1	1.0	54	9	9.4
39	1	1.0	55	6	6.3
41	1	1.0	56	3	3.1
43	3	3.1	57	4	4.2
44	2	2.1	58	6	6.3
45	2	2.1	59	4	4.2
46	2	2.1	60	5	5.2
47	3	3.1	61	5	5.2
48	4	4.2	62	4	4.2
49	3	3.1	63	3	3.1
50	4	4.2	65	2	2.1
51	3	3.1	67	5	5.2
52	3	3.1	69	2	2.1
53	5	5.2	71	1	1.0

Table 4.9

Inquiry Mode Questionnaire Analyst (N=96)

Score	Frequency	%	Score	Frequency	%
40	1	1.0	58	8	8.3
41	1	1.0	59	1	1.0
42	2	2.1	60	7	7.3
46	1	1.0	61	5	5.2
48	7	7.3	62	2	2.1
49	2	2.1	63	2	2.1
50	3	3.1	64	3	3.1
51	10	10.4	65	3	3.1
52	10	10.4	66	2	2.1
53	1	1.0	67	1	1.0
54	4	4.2	68	3	3.1
55	6	6.3	70	1	1.0
56	2	2.1	71	1	1.0
57	5	5.2	73	2	2.1

In regards to the Analyst (Table 4.9), the Analyst category scored a mean of 56.21, with a standard deviation of 7.037. The most frequent scores were 51 and 52, with

the range of scores between 49 – 54 accounting for 31.3% of all analyst scores. The lowest score in the Analyst range was 40, with the highest score equaling 73.

In regards to the Realist (Table 4.10), the Realist category scored a mean of 54.55, with a standard deviation of 5.498. The most frequent score is 57, with the range of scores between 55 – 59 accounting for 33.3% of the scores. The lowest score in the Realist range was 42, with the highest score equaling 70.

Table 4.10

Inquiry Mode Questionnaire Realist (N=96)

Score	Frequency	%	Score	Frequency	%
42	2	2.1	56	8	8.3
44	2	2.1	57	11	11.5
45	2	2.1	58	8	8.3
46	3	3.1	59	5	5.2
47	3	3.1	60	4	4.2
48	1	1.0	61	2	2.1
49	6	6.3	62	4	4.2
50	3	3.1	63	1	1.0
51	3	3.1	64	1	1.0
52	8	8.3	65	1	1.0
53	6	6.3	67	1	1.0
54	6	6.3	70	1	1.0
55	4	4.2			

Table 4.11 contains data on the thinking styles from the results of the *Learning Connections Inventory* that was administered to selected student athletes during the 2008/2009 academic school year at Rowan University.

Table 4.11

Learning Styles of the Learning Connections Inventory (N=96)

Thinking Styles	Mean	Median	Standard Deviation
Sequence	26.41	26.50	3.648
Precision	21.53	21.00	3.598
Technical Reasoning	22.28	22.00	4.911
Confluence	20.17	20.00	3.402

Table 4.12 contains data on the different learners as categorized by the *Learning Connections Inventory.*

Table 4.12

Types of Learners of the Learning Connections Inventory (N=96)

Thinking Styles	Frequency	%
Dynamic Learner	79	82.3
Bridge Learner	12	12.5
Strong Willed Learner	5	5.2

In regards to *Learning Connection Inventory,* the Sequence category (Table 4.13) scored a mean of 26.41, with a standard deviation of 3.648. The most frequent scores were 25 and 27 with the scores between 25 – 27 constituting 37.5% of all scores. The lowest score in the Sequence range was 17, with the highest score equaling 35.

Table 4.13

Learning Connections Inventory Sequence (N=96)

Score	Frequency	%
17	1	1.0
18	3	3.1
20	2	2.1
21	3	3.1
22	4	4.2
23	6	6.3
24	6	6.3
25	13	13.5
26	10	10.4
27	13	13.5
28	7	7.3
29	10	10.4
30	4	4.2
31	5	5.2
32	6	6.3
33	1	1.0
34	1	1.0
35	1	1.0

In regards to the Precision category (Table 4.14), Precision scored a mean of 21.53, with a standard deviation of 3.598. The most frequent score was 19 with the scores between 18-20 constituting 34.4% of all scores. The lowest score in the Precision range was 12, with the highest score equaling 31.

Table 4.14

Learning Connections Inventory Precision (N=96)

Score	Frequency	%
12	1	1.0
13	1	1.0
14	1	1.0
16	3	3.1
17	3	3.1
18	4	4.2
19	16	16.7
20	13	13.5
21	7	7.3
22	13	13.5
23	11	11.5
24	5	5.2
25	6	6.3
26	2	2.1
27	2	2.1
28	5	5.2
30	2	2.1
31	1	3.3

In regards to Technical Reasoning category (Table 4.15), Technical Reasoning scored a mean of 22.28, with a standard deviation of 4.911. The most frequent score was 21 with the scores between 20 – 22 constituting 26% of all scores. The lowest score in the Technical Reasoning range was 7, with the highest score equaling 34.

Table 4.15

Learning Connections Inventory Technical Reasoning (N=96)

Score	Frequency	%
7	1	1.0
9	1	1.0
12	1	1.0
14	1	1.0
15	1	1.0
16	4	4.2
17	5	5.2
18	6	6.3
19	6	6.3
20	8	8.3
21	11	11.5
22	6	6.3
23	10	10.4
24	3	3.2
25	4	4.2
26	8	8.3
27	8	8.3
28	3	3.1
29	3	3.1
30	1	1.0
31	1	1.0
32	3	3.2
34	1	1.0

In regards to the Confluent category (Table 4.16), Confluent scored a mean of 20.17 with a standard deviation of 3.402. The most frequent score were 17 and 20 with the scores between 16 -18 and 19-21 both constituting 33.3% of all scores. The lowest score in the Sequence range was 16, with the highest score equaling 31.

Table 4.16

Learning Connections Inventory Confluence (N=96)

Score	Frequency	%
7	1	1.0
12	2	2.1
15	2	2.1
16	5	5.2
17	6	6.3
18	10	10.4
19	13	13.5
20	17	17.7
21	11	11.5
22	7	7.3
23	8	8.3
24	5	5.2
25	3	3.1
26	3	3.1
27	1	1.0
28	1	1.0
29	1	1.0

Research Question 2: Is there a significant relationship between student-athletes' thinking and learning styles and the demographic variables of gender, academic major, sports participation, academic classification, and G.P.A.?

A Pearson product moment was calculated for the relationship between sports participation and the different categories of the *Inquiry Mode Questionnaire* (see Table 4.17). A weak negative correlation was found regarding sports participation and the Idealist category on the *Inquiry Mode Questionnaire* ($r = -.222, p < .05$). Only four (4.2%) of the 96 respondents scored between the scores of 36-46, while 22 (23%) of the respondents scored between the scores of 61-71.

Table 4.17

Correlation between Sport Participation and the Inquiry Mode Questionnaire (N = 96)

Statement	*r*	*p*
Sport Participation and the *Inquiry Mode Questionnaire* Idealist.	-.222*	.03

* Correlation is significant at the 0.05 level (2-tailed).

A Pearson product moment was calculated for the relationship between academic major and the different categories of the *Learning Connections Inventory* (see Table 4.18). A moderate negative correlation was found regarding academic major and the Technical Reasoning category on the *Learning Connections Inventory* ($r = -.288, p < .01$). One hundred percent of the Chemical Engineering and Mechanical Engineering scored higher than a 26 on the Technical Reasoning category. Conversely, 100% of the English/Elementary Education, Early Education, Math and Science Education, Radio/Television/Film, Marketing, and Communications majors scored under a 22 on the Technical Reasoning category.

Table 4.18

Correlation between Academic Major and the Learning Connections Inventory (N = 96)

Statement	*r*	*p*
Academic Major and the *Learning Connections Inventory Technical Reasoning*.	-.288**	.004

** Correlation is significant at the 0.01 level (2-tailed).

A Pearson product moment was calculated for the relationship between gender and the different categories of the *Learning Connections Inventory* (see Table 4.19). A moderate correlation was found regarding gender and the Sequence category on the *Learning Connections Inventory* ($r = .332, p < .01$). Forty two percent of the male respondents and 56.9 % of the female respondents scored between a 25-29 on the

Learning Connections Inventory Sequence category. A second Pearson product moment was calculated for the relationship between gender and the different categories of the *Learning Connections Inventory* (see Table 4.19). A moderate negative correlation was found regarding gender and the Technical Reasoning category on the *Learning Connections Inventory* ($r = -.407, p < .01$). Forty three percent of the female respondents scored below a 20 on the Technical Reasoning category of the *Learning Connections Inventory*. Conversely, 48.4% of the male respondents scored a 26 or higher on the Technical Reasoning category of the *Learning Connections Inventory*.

Table 4.19

Correlation between Gender and the Learning Connections Inventory (N = 96)

Statement	*r*	*p*
Gender and the *Learning Connections Inventory* Sequence.	.322**	.001
Gender and the *Learning Connections Inventory* Technical Reasoning.	-.407**	.000

** Correlation is significant at the 0.01 level (2-tailed).

Research Question 3: Is there a significant relationship between thinking and learning styles utilizing the *Inquiry Mode Questionnaire* and the *Learning Connections Inventory*?

A Pearson product moment was calculated for the relationship between the *Inquiry Mode Questionnaire* Synthesist and the other thinking categories of the *Inquiry Mode Questionnaire* (see Table 4.20). A moderately strong negative correlation was discovered between the *Inquiry Mode Questionnaire* Synthesist and the *Inquiry Mode Questionnaire* Pragmatist. ($r = -.535, p < .01$). The mean for the Synthesist category was 48.27, while the Pragmatist category had a mean 54.99. A moderate negative correlation was discovered between the *Inquiry Mode Questionnaire* Synthesist and the *Inquiry*

Mode Questionnaire Analyst (r = -.270, p<.01). The mean for the Synthesist category was 48.27, while the Analyst category had a mean of 56.21. Another statistically significant moderately strong positive correlation was discovered between the *Inquiry Mode Questionnaire* Synthesist and the *Inquiry Mode Questionnaire* Realist (r = -.355, p<.01). The mean for the Synthesist category was 48.27, while the Realist had a mean of 54.55.

Table 4.20

Correlation between InQ Synthesist and other InQ Thinking Categories (N = 96)

Statement	*r*	*p*
InQ Synthesist vs. *InQ* Pragmatist	-.535**	.000
InQ Synthesist vs. *InQ* Analyst	-.270**	.008
InQ Synthesist vs. *InQ* Realist	-.355**	.000

** Correlation is significant at the 0.01 level (2-tailed).

A Pearson product moment was calculated for the *Inquiry Mode Questionnaire* Idealist and the other thinking categories of the *Inquiry Mode Questionnaire* (see Table 4.21). A weak negative correlation was discovered between the *Inquiry Mode Questionnaire* Idealist and *Inquiry Mode Questionnaire* Pragmatist (r = -.245, p<.05). Eighty nine percent of the respondents who scored between 36-48 on the *Inquiry Mode Questionnaire* Idealist scored above a 58 on the *Inquiry Mode Questionnaire* Pragmatist. Another moderately strong negative correlation was discovered between the *Inquiry Mode Questionnaire* Idealist and the *Inquiry Mode Questionnaire* Analyst (r = -.526, p<.01). One hundred percent of the respondents who scored lower than 52 on the *Inquiry Mode Questionnaire* Idealist scored at or higher on the *Inquiry Mode Questionnaire* Analyst category.

Table 4.21

Correlation between InQ Idealist and other InQ Thinking Categories (N =96)

Statement	*r*	*p*
InQ Idealist vs. *InQ* Pragmatist	-.245*	.016
InQ Idealist vs. *InQ* Analyst	-.526*	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

A Pearson product moment was calculated for the *Learning Connections Inventory* Sequence and the other learning categories of the *Learning Connections Inventory* (see Table 4.22). A moderate correlation was discovered between the *Learning Connections Inventory* Sequence and *Learning Connections Inventory* Precision (r = .285, p<.01). Fifty four percent of the respondents scored between 22-27 on the *Learning Connections Inventory* Sequence and 40.6% of the respondents scored between 22-27 on the *Learning Connections Inventory* Precision. A moderate negative correlation was discovered between the *Learning Connections Inventory* Sequence and the *Learning Connections Inventory* Technical Reasoning (r = -.280, p<.01). Of the 14 respondents who scored a 17 or lower on the *Learning Connections Inventory* Technical Reasoning, 13 of them (92.9 %) scored a 25 or higher on the *Learning Connections Inventory* Sequence. A moderate negative correlation was discovered between the *Learning Connections Inventory* Sequence and the *Learning Connections Inventory* Confluence (r = -.257, p<.05). Of the 10 respondents who scored a 16 or lower on the *Learning Connections Inventory* Confluence category, 100% of these respondents scored a 25 or above on the *Learning Connections Inventory* Sequence category.

Table 4.22

Correlation between LCI Sequence and other LCI Learning Categories (N = 96)

Statement	*r*	*p*
LCI Sequence vs. *LCI* Precision	.285**	.005
LCI Sequence vs. *LCI* Technical Reasoning	-.280**	.006
LCI Sequence vs. *LCI* Confluence	-.257*	.011

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

A Pearson product moment was calculated for the *Learning Connections Inventory* Technical Reasoning category and the *Learning Connections Inventory* learning categories (see Table 4.23). A moderate correlation was discovered between the *Learning Connections Inventory* Technical Reasoning and *Learning Connections Inventory* Confluence. ($r = .422$, $p<.01$). In regards to the *Learning Connections Inventory* Technical Reasoning, 35 (36.5%) of the respondents of scored between 20-23, while 43 respondents (44.8%) had similar scores on the *Learning Connections Inventory* Confluence category.

Table 4.23

Correlation between the LCI Technical Reasoning and LCI Learning Categories (N =96)

Statement	*r*	*p*
LCI Technical Reasoning vs. *LCI* Confluence	.422**	.000

** Correlation is significant at the 0.01 level (2-tailed).

A Pearson product moment was calculated for the *Inquiry Mode Questionnaire* thinking categories and *Learning Connections Inventory* learning categories (see Table 4.24). A moderate negative correlation was discovered between the *Inquiry Mode Questionnaire* Pragmatist and *Learning Connections Inventory* Precision. ($r = -.315$,

$p<.01$). Seventy five percent of the respondents who scored between 34 and 46 on the *Inquiry Mode Questionnaire* Pragmatist category scored a 22 or higher on the *Learning Connections Inventory* Precision category. Another weak negative correlation was discovered between the *Inquiry Mode Questionnaire* Realist and the *Learning Connections Inventory* Confluence ($r=-.210$, $p<.05$). One hundred percent of the respondents who scored a 63 or above on the *Inquiry Mode Questionnaire* Realist category scored a 19 or lower on the *Learning Connections Inventory* Confluence category.

Table 4.24

Correlation between the Inquiry Mode Questionnaire and the Learning Connections Inventory
(N =96)

Statement	*r*	*p*
InQ Pragmatist vs. *LCI* Precision	-.315**	.002
InQ Realist vs. LCI Confluence	-.210*	.040

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study

The purpose of this study was to determine the learning and thinking styles of selected student-athletes at Rowan University to determine if they were any significant relationships between learning and thinking styles and academic achievement. This study was conducted at Rowan University during 2008/2009 academic school year. The study provided insight on the learning and thinking styles of student athletes, the impact of these learning and thinking styles on the variables of gender, academic classification, grade point average, sport participation, and academic major, and how the learning and thinking styles correlated with each other. The subjects in this study were 96 student-athletes selected proportionally to represent 12 of the 16 sports sponsored at the NCAA varsity level by Rowan University.

Two surveys were used in this study. To obtain the think styles of the selected student-athletes, a survey created by Harrison & Bramson (1982), the *Inquiry Mode Questionnaire* (InQ) was utilized. The survey provided five different learning styles, Synthesist, Idealist, Pragmatist, Analyst, and Realist in which selected student athletes were classified.

The second survey was the *Learning Connections Inventory,* LCI, formulated by Johnston (2006), and used extensively at Rowan University. The survey was utilized to

ascertain the learning styles of the selected student-athletes. The LCI includes 28 Likert-item forced choice questions which help determine a respondent's learning style.

To protect and guarantee the rights of all subjects associated with the study, Institutional Review Board (IRB) approval was necessary. The IRB application was approved on January 2009 (Appendix A). Upon approval from the IRB, the selected student-athletes were surveyed. Each student-athlete was given a brief explanation of the parameters of the study, and further instruction in regards to administering of the surveys. Two hundred surveys were distributed to the selected student-athletes. Ninety-six *Inquiry Mode Questionnaire* and *Learning Connections Inventory* were returned, yielding a return rate of 48%. Student athletes from men and women's track and field and men's basketball did not participate in the study.

The Statistical Package for the Social Sciences (SPSS) computer software was utilized to analyze data. SPSS was utilized to calculate Pearson product-moment correlations, descriptive statistics, including means, modes, standard deviations, and percentages regarding the different learning and thinking styles of the student-athletes. Moreover, SPSS was utilized to determine correlations and significant relationships between learning and thinking styles and academic achievement.

Discussion of the Findings

Research Question 1: What are the thinking and learning styles of selected student-athletes at Rowan University?

The findings show that the selected student-athletes at Rowan University have a wide array of learning and thinking styles. In regards to the *Inquiry Mode Questionnaire*,

selected student-athletes at Rowan University scored on average Synthesist – 48.27, Idealist – 55.98, Pragmatist – 54.99, Analyst – 56.21, Realist – 54.55. Four of the five category scores fall into the neutral range of 49 – 59, which indicates there is no preference or inclination against this style. The Synthesist category falls into the classification of having a moderate inclination against the use of this style. Scores lower than 48 indentify areas of strategic thinking that are under-used or under-developed. The respondents scored highest in the Analyst category, followed by the Idealist, Pragmatist, and Realist. These scores were within four points which are known as equal scores.

These findings are consistent with Borlandoe (2004) who found the most common thinking style for women administrators at the community college level in the selected states was the Idealist and Analyst thinking styles. Harrison and Bramson (1982) found similar findings, with the Idealist (37%) being the most common thinking style, followed by the Analyst (35%). The Synthesist was found to be the least common thinking style, with only 11% of the respondents being categorized as Synthesists. Moreover, these findings are consistent with Jones (2006) who found the thinking styles of Idealist and Analyst best described the respondents with 75% of them scoring high in at least one of the thinking styles and with the Synthesist being the last preferred thinking style of the respondents. However, Jones' finding of the thinking styles of Realist, Synthesist, and Pragmatist had a neutral preference was inconsistent with the findings of this study.

In regards to the *Learning Connections Inventory*, selected student athletes at Rowan University scored the mean scores of Sequence – 26.41, Precision – 21.53, Technical Reasoning – 22.28, Confluence, 20.17. Three of the four learning categories

fall into the as needed classification, with Sequence falling into the first use classification. The results fall somewhat in line with the findings of Learning Connections Resources, LLC (2004) with 82.3% of the respondents being classified as dynamic learners, while Learning Connections Resources, LLC noted that dynamic learners account for approximately 88% percent of all respondents of the *Learning Connections Inventory.* However, Learning Connections Resources, LLC reported that strong willed learners accounted for approximately 10% of all respondents of the LCI, while this study discovered only 5.2% of the respondents were strong willed learners. Bridge learners according to the Learning Connections Resources, LLC accounted for approximately 2% of all respondents who complete the LCI, while this study found that bridge learners constituted 12.5% of the sample population.

Research Question 2: Is there a significant relationship between student-athletes' thinking and learning styles and the demographic variables of gender, academic major, sports participation, academic classification, and G.P.A.?

The findings showed no significant correlation between thinking and learning styles and the variables of academic classification and GPA. The demographic variable of sports participation depicted one weak correlation between student athletes' sport participation and the *Inquiry Mode Questionnaire* Idealist thinking category (r=.222, p=.003) at a p<0.01 level. Academic major depicted one moderate negative correlation between student athletes' academic major and the *Learning Connections Inventory* Technical Reasoning learning category (r=-.288, p=.004) at a p<0.01 level. Two correlations were found between the demographic variable gender and the *Learning*

Connections Inventory Sequence and Technical Reasoning learning styles. A moderate correlation between gender and Sequence learning style was found (*r=.322, p=.001*) at a $p<.0.01$ level. A moderate negative correlation was found between gender and the Technical Reasoning learning style (*r=-.407, p=.000)* at a $p<0.01$ level.

The findings of this study do not support Golian (1998) about differences in thinking styles amongst the genders, with the only significant correlations being represented through the *Learning Connections Inventory*. Harrison & Bramson (1982) neither confirms nor denies differences based on the genders. Harrison & Bramson concluded that no two human eyes are the same and differences in perceptions are endless which make the world a different place for each person. The differences in thinking styles compound the complexity of perception. This study does not confirm the assertion of Newell, Dahm, Harvey, and Newell (2004) about the importance of metacognition, but is consistent with the importance of learning styles and decision making in academic settings.

Research Question 3: Is there a significant relationship between thinking and learning styles utilizing the *Inquiry Mode Questionnaire* and the *Learning Connections Inventory*?

The findings showed the greatest number of significant correlations between the different thinking styles of the *Inquiry Mode Questionnaire*. A moderately strong negative correlation was found between the *Inquiry Mode Questionnaire* Synthesist and the *Inquiry Mode Questionnaire* Pragmatist (*r=-.535, p.000)* at a $p<0.01$ level. Another moderate negative correlation was discovered between the *Inquiry Mode Questionnaire*

Synthesist and the *Inquiry Mode Questionnaire* Analyst (*r=-.270, p=.008)* at a $p<0.01$ level. A moderate negative correlation was found between the *Inquiry Mode Questionnaire* Synthesist and the *Inquiry Mode Questionnaire* Realist (*r=-.355, p=.000)* at a $p<0.01$ level. A weak negative correlation was discovered between the *Inquiry Mode Questionnaire* Idealist and the *Inquiry Mode Questionnaire* Pragmatist (*r=-.245, p=.016)* at a $p<0.05$ level. A moderately strong negative correlation was discovered between the *Inquiry Mode Questionnaire* Idealist and the *Inquiry Mode Questionnaire* Analyst (*r=-.526, p=.000)* at a $p<0.01$ level.

These findings are consistent with the findings of the InQ Educational Materials Inc. (2001) stating that the most common combinations of styles are Idealist/Analyst, Analyst/Realist, and Synthesist/Idealist. Harrison and Bramson (1982) list the most popular combinations of thinking styles as Idealist-Analyst, Analyst-Realist, Synthesist- Idealist, and Idealist and Realist. The findings are also consistent with less common combinations of styles are the Synthesist combined with the Pragmatist, Analyst and Realist.

The findings depicted correlations between the learning styles of the *Learning Connections Inventory.* A moderate correlation was discovered between the *Learning Connections Inventory* Sequence and the *Learning Connections Inventory* Precision (*r=.285, p=.005)* at a $p<0.01$ level. A moderate negative correlation was discovered between the *Learning Connections Inventory* Sequence and the *Learning Connections Inventory* Technical Reasoning (*r=-.280, p=.006)* at a $p<0.01$ level. A moderate negative correlation was discovered between the *Learning Connections Inventory* Sequence and

the *Learning Connections Inventory* Confluence (*r=-.257, p=.011)* at a $p<0.05$ level. A moderate correlation was discovered between the *Learning Connections Inventory* Technical Reasoning and the *Learning Connections Inventory* Confluence (*r=.422, p=.000)* at a $p<0.01$ level.

The findings depicted correlations between the thinking styles of the *Inquiry Mode Questionnaire* and the learning styles of the *Learning Connections Inventory.* A moderate negative correlation was discovered between the *Inquiry Mode Questionnaire* Pragmatist and the *Learning Connections Inventory* Precision (*r=-.315, p=.002)* at a $p<0.01$ level. A weak negative correlation was discovered between *the Inquiry Mode Questionnaire* Realist and the *Learning Connections Inventory* Confluence (*r=-.210, p=.04)* at a $p<0.05$ level.

These findings support the definition of the different thinking and learning styles. InQ Educational Materials, Inc. (2001) defines pragmatists as people having a high tolerance for ambiguity without structure and predictability of absolute answer. Learning Connections Resources, LLC (2004) defines the precision learning style as learners who seek thorough explanations with a quest of being correct. Moreover, InQ Educational Materials, Inc defines the realist thinking style as thinkers who crave concrete results and trust their surroundings to make educated decisions. Conversely, the Learning Connections Resources, LLC defines the confluent learning style as learners who trust their instincts rather than their surroundings and tends to march to the beat of their own drummer. Johnston (1998) feels the existence of interactive learning patterns allows

learners to grasp other learning patterns. Moreover, it does not matter where the learner starts, but how the learner goes about the different processes of learning.

Conclusions

There are several findings that emerged from this study. First, the study suggests that there is no correlation between academic achievement and grade point average and the learning and thinking styles of selected student athletes at Rowan University. These results are consistent with previous studies performed by D. Miller (2000) and Ayaz (1998) where there was little or no significance between the implementation of learning styles and academic empowerment. However, the fact that the learning and thinking styles do not directly affect academics is merely based on grade point average in this case, not on other factors of academics, such as student engagement and career placement.

The findings do show that the learning and thinking style assessment tools can be beneficial for use in the collegiate setting. Although it may not be a predictor of academic success, learning and thinking styles do show correlations with gender, academic major, and sport participation, which led to a better understanding of the student-athlete. The first set of findings showed that there was a significant relationship between sports participation and thinking styles. This suggests that different types of thinking styles may be better suited for different sports. The second set of findings showed that there was a significant relationship between learning styles and academic majors. This suggests that student athlete uses their learning style, possibly without metacognition, to chose what academic major they either like the most, or will be able

achieve the best grades. The third set of findings showed a significant correlation between gender and learning styles. This suggests that men and women student athletes learn differently, and instructions to each gender should be done in different manners. The fourth set of findings showed a significant correlation between different learning and thinking styles. This suggests that thinking and learning styles should be used in conjunction with each other to best suit the needs of the student athlete.

This study further validates that learning and thinking styles in themselves, are not directly related to academic achievement in terms of grade point average. Many student athletes reported a wide array of thinking and learning styles with a wide array of academic achievement. The importance of learning and thinking styles however, should not be discounted. Although thinking and learning are not directly related to academic achievement, the implications for athletic coaches and advisors are endless. The ability to recognize how a student-athlete thinks and learns can be the passage way into breaking barriers between athletic coaches, advisors, and other forms of authority on a college campus. In regards to athletic coaching, thinking and learning styles can be keys to coaching student-athletes to higher and greater expectations. In no ways do thinking and learning styles take the place of discipline, hard work, motivation, and the concept of the importance of the team over the importance of the individual, but they can accompany these tenets to benefit the team as a whole. Understanding thinking and learning styles as an athletic coach leads to overcoming hurdles in the teaching process and connecting with the student-athlete. Not every student-athlete thinks and learns in the same way, so why should they be taught and coached in the same way. Most good coaches utilize this

skill without the knowledge of thinking and learning styles. If coaches and student-athletes utilized this knowledge with their past experiences, the rewards could be endless. The light bulb should not click on in the coach's or advisor's head when they are able to coach or advise a student-athlete, but rather when they realize how to coach and advise a student-athlete to achieve greater potential. Moreover, thinking and learning styles can be utilized as ways to motivate student-athletes on and off the field. Academic advisors and coaches must be cognizant of these thinking and learning styles to reach student-athletes to increase motivation. Some student-athletes clam up when they are called out, while others thrive. Understanding thinking and styles can lead to greater motivation and enthusiasm for coaches, advisors, and student-athletes. Thinking and learning styles should be studied further to best facilitate what these styles mean in helping student-athletes through their collegiate experience as both a student and an athlete, which indirectly, may lead to greater academic achievement.

Recommendations for Practice

1. Colleges and universities should recognize the importance of different learning and thinking styles, along with the importance of individual instruction.
2. Through different courses, possibly a leadership course or freshman seminar, students can understand personal learning and thinking styles to aid students to become metacognitive.
3. Coaches, not just advisors and professors, should become much more aware of learning and thinking styles as away to facilitate success of their student athletes.

4. Further steps should be taken to integrate metacognition to all constituents of a campus, including staff, faculty, and students.

Recommendations for Further Research

Based on the findings and conclusions of this study, the following suggestions are presented:

1. Further studies should be done with a larger selection of student-athletes to confirm accuracy of the findings.

2. Further studies should be done with different groups to confirm accuracy of findings and open new doors to possible research.

3. Further studies should be done to examine the importance of self assessment testing measuring learning and thinking styles.

4. This study should be replicated at different NCAA classified institutions (I, II, III) and NAIA institutions to discover possible differences or similarities.

5. Pre-tests and post-tests should be delivered with education to students about learning and thinking styles and how to best utilize them in higher education.

6. Further studies should measure the importance and significance of learning and thinking styles at different levels of education.

REFERENCES

Adler P., & Adler P.A. (1985). From idealism to pragmatic detachment: The academic performance of college athletes. *Sociology of Education, 58* (4), 241-250. Retrieved November 14, 2007 from *JStor*.

Allen, M.S. (1999). The academic socialization of intercollegiate athletes: An examination of team subculture influence on academic achievement. Retrieved October 7, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 9737391)

Ayaz, S.M. (1998). The effect of a supplemental multiple modalities learning program on the academic success of student athletes at Florida Atlantic University. Retrieved July 18, 2008 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 9839316)

Barbe, W.B., Swassing, R.H., & Milone, M.N. (1979). *Teaching through modality strengths: Concepts and practice*. Columbus, OH: Zaner-Bloser.

Borlandoe, J. M. (2005). An examination of thinking styles of community college women administrators in three mid-Atlantic states. Retrieved July 5, 2008 from *ProQuest:* Digital Dissertations and Thesis Database. (UMI No. 3156267)

Bowen, W.G., & Levin, S.A. (2003) *Reclaiming the game: College sports and educational values.* Princeton, NJ: Princeton University Press.

Buchler, J. (1961). *The concept of method.* New York, NY: Columbia University Press.

Bullard, R.W. (2007). A look in the mirror: Student-athletes' attitudes on student performance at Rowan University. Unpublished course paper, Rowan University, Glassboro, NJ, USA.

Catron, G.O. (2005). Stress: Origins, perceptions, and management techniques used among intercollegiate student-athletes at Bluefield College. Retrieved October 7, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 1440783)

Covell, D.D. (1999). An examination of the perceived role of intercollegiate athletics in the New England Small College Athletic Conference. Retrieved October 11, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 9950146)

Churchman, C.W. (1971). *The design to inquiring systems*. New York, NY: Basic Books.

Dickerson, J. (2007). Academic performance of selected student athletes during in and out-of-season participation. Unpublished course paper, Rowan University, Glassboro, NJ, USA.

Evans, B.L. (2000). Academic achievement of student athletes: Semester of competition versus semester of non-competition. Retrieved October 2, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 9960720)

Fingers, E.M. (2005). Character development and intercollegiate athletics: An analysis of perceptions, roles, values, and behaviors of collegiate coaches, athletic directors, and presidents as related to student –athlete character development. Retrieved October 7, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 3204712)

Golian, L. M. (1998). Thinking style differences among academic librarians. Retrieved July 5, 2008 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 9839320)

Harrison, A.F., & Bramson, R.M. (1982). *The art of thinking: The classic guide to increasing brain power.* New York: Berkeley Publishing Group.

Hiemstra, R., & Sisco, B. (1990). *Individualizing instruction: Making learning personal, empowering, and successful.* San Francisco: Jossey-Bass.

Hildenbrand, K. (2005). An examination of college student-athletes' academic achievement. Retrieved October 7, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 3203840)

InQ Educational Materials, Inc. (2003). Information retrieved July 3, 2008 from company website, http://www.inq-hpa.com/about.html

InQ Educational Materials, Inc. (2001). Assessing your thinking profile: A self-help guide to understanding the way you think. Oakland, CA: InQ Educational Materials.

James, W.B., & Blank, W.E. (1993). In D.D. Flannery (Ed.) *Applying cognitive learning theory to adult learning* (pp.47-57). New Directions for Adult and Continuing Education, No. 59. San Francisco: Jossey-Bass

Johnston, C. (1994). *The interactive learning model*. Paper presented at the meeting of the British Education Research Association, Oxford University, Queen Anne's College, Oxford, UK. Retrieved June 1, 2008 from www.letmelearn.org

Johnston, C. (1998). *Let me learn.* Thousand Oaks, CA: Corwin Press.

Johnston, C. (2006). The Let Me Learn process: A research-based system of learning which provides a metacognitive platform for instructor and learner growth and development. Retrieved June 1, 2008 from www.letmelearn.org.

Jones, M.S. (2006). Thinking style differences of female college and university presidents: A national study. Retrieved July 2, 2008 from *ProQuest:* Digital Dissertations and Thesis Database. (UMI No. 3298770)

Jorgensen, D.W. (2004). One size doesn't fit all: Achieving accountability through application of learning patterns. Paper published in the proceedings of the CTMS Conference, Reno, Nevada. Retrieved June 1, 2008 from www.letmelearn.org

Kolb, D.A. (1984). *Experiential learning: Experience as the source of learning and development.* Englewood Cliffs, NJ: Prentice Hall.

Kressler, P. (2002). Is American economic history alive? An experiment. Presented at the annual meetings of ASSA, Atlanta, GA. in Kressler, P.R. (2003). The effects of innovative teaching on student growth in knowledge of economics and the intentional use of their learning processes. Paper presented at the annual meeting of DEBE, Edinburgh, Scotland. Retrieved June 1, 2008 from www.letmelearn.org

Kressler, P.R. (2003). The effects of innovative teaching on student growth in knowledge of economics and the intentional use of their learning processes. Paper presented at the annual meeting of DEBE, Edinburgh, Scotland. Retrieved June 1, 2008 from www.letmelearn.org

Learning Connections Resources, LLC. (2004). Information retrieved March 28, 2009 from company website, http://www.lcrinfo.com/results.php?iid=Mg==

Marcellino, P.A. (2006). A team building model for the educational leadership classroom. Retrieved June 1, 2008 from www.letmelearn.org

Miller, D. (2000). Learning styles and student athletes: The effect of the diagnosis and interpretation of learning styles of self-perception of study orientation and feelings of academic empowerment. Retrieved May 27, 2008 from *ProQuest:* Digital Dissertations and Thesis Database. (UMI No. 9995931)

Miller, P.S. (2000). Student-athletes' perceptions of psychosocial development through intercollegiate athletic participation. Retrieved October 9, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (National Library of Canada No. 0-612-53672-6)

National Collegiate Athletic Association. (2007). Division III talking points. Retrieved on July 6, 2008 from http://www.ncaa.org/wps/ncaa?ContentID=24

Newell, J., Dahm, K., Harvey, R., & Newell, H. (2004). Developing metacognitive engineering teams. *Chemical Engineering Education, Fall 2004,* 316-320. Retrieved June 1, 2008 from www.letmelearn.org

Robst, J., & Keil, J. (2000). The relationship between athletic participation and academic performance: Evidence from Division III. *Applied Economics*, *32*, 547-558. Retrieved June 17, 2008 from *EBSCO Host*: Research Database.

Smith, B.A. (2004). Balancing acts: Student-athletes negotiating academic interest and school resistance. Retrieved October 9, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 3147006)

Stavisky, A.S. (1998). An examination of the latent variables that contribute to student-athlete role conflict: A structural equation model. Retrieved October 10, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 9921638)

Stroll, S.K. (1995). Moral reasoning of Division III and Division I athletes: Is there a difference? Paper presented at the Annual Meeting of the American Alliance of Health, Physical Education, Recreation, and Dance, Portland, Oregon. Retrieved June 15, 2008 from *EBSCO Host:* Research Database

Wempe, P.A. (2001). A comparison of the academic progress of student athletes during their semester of competition and non-competition. Retrieved October 9, 2007 from *ProQuest*: Digital Dissertations and Thesis Database. (UMI No. 3037836)

APPENDIX A

Institutional Review Board Approval Letter

Rowan University

December 17, 2008

Robert W. Bullard
Athletics, Esbyjornson Gym
Rowan University
201 Mullica Hill Road
Glassboro, NJ 08028

Dear Robert W. Bullard:

In accordance with the University's IRB policies and 45 CFR 46, the Federal Policy for the Protection of Human Subjects, I am pleased to inform you that the Rowan University Institutional Review Board (IRB) has approved your project:

IRB application number: 2009-086

Project Title: The Learning Curve: The Impact of Learning and Thinking Styles of Student Athletes on Academic Achievement at Rowan University

In accordance with federal law, this approval is effective for **one calendar year** from the date of this letter. If your research project extends beyond that date or if you need to make significant modifications to your study, you must notify the IRB immediately. Please reference the above-cited IRB application number in any future communications with our office regarding this research.

Please retain copies of consent forms for this research for three years after completion of the research.

If, during your research, you encounter any unanticipated problems involving risks to subjects, you must report this immediately to Dr. Harriet Hartman (hartman@rowan.edu or call 856-256-4500, ext. 3787) or contact Dr. Gautam Pillay, Associate Provost for Research (pillay@rowan.edu or call 856-256-5150).

If you have any administrative questions, please contact Karen Heiser (heiser@rowan.edu or 856-256-5150).

Sincerely,
Harriet Hartman

Harriet Hartman, Ph.D.
Chair, Rowan University IRB

c: Burt Sisco, Educational Leadership, Education Hall

Office of Research
Bole Hall Annex
201 Mullica Hill Road
Glassboro, NJ 08028-1701

856-256-5150
856-256-4425 fax

APPENDIX B

Student Athlete Consent Form

Learning and Thinking Styles of Student Athletes

A Research Study Conducted by: Robert Bullard
Faculty Advisor: Burton Sisco, Ed. D.

While your participation in this survey is voluntary and you are not required to answer any of the questions herein, your cooperation and participation are important to the success of the project and are greatly appreciated. If you choose to participate, please understand that all responses are strictly confidential and the only personally identifiable information being requested is your student identification number. Your student identification number will be used to link this survey to your completed Learning Connection Inventory survey. Once this has been done, a new coded number will be used that is not linked to your personal information, and the page with the original student identification number will be shredded and discarded. The completion of both surveys should take no longer than 30 minutes. Your completion of this survey constitutes informed consent and your willingness to participate.

If you have any questions about the nature of this research, you may contact the following:

Robert Bullard
201 Mullica Hill Road
Glassboro, NJ 08028
(856) 256-4687
bullardr@rowan.edu

Burton Sisco, Ed.D.
201 Mullica Hill Road
Glassboro, NJ 08028
(856) 256-3717
sisco@rowan.edu

If you have any questions about your rights as a research subject, you may contact the Associate Provost for Research at:

Rowan University Institutional Review Board for the Protection of Human Subjects
Office of Research
201 Mullica Hill Road
Glassboro, NJ 08028-1701
(856) 256-5150

I. Student Identification Number

Student Identification Number/Name _____

- **Student Identification number is being used as a way of to identify the survey you complete on-line, the *Learning Connections Inventory*. Once the test is identified, your student identification number will be shredded and no longer used for the purposes of identification, a new coded number will take their place.**

APPENDIX C

Background and Demographic Information

II. Demographic Information

Academic Classification _____

Grade Point Average _____

Academic Major _____

Sport Participated in_____

Gender _____

APPENDIX D

The Learning Connections Inventory

Name_____

Part I.

This is a way to find out about how you accomplish learning tasks. Below are 28 statements each followed by five phrases that indicate how the statement might relate to you–"never ever," "almost never," "sometimes," "almost always," and "always."

Directions: Here is what you are to do. 1) Read each sentence carefully. 2) Decide how well it fits what you do to learn. 3) Circle the phrase that matches your response. Be sure that you circle only one phrase for each statement.

Let's practice!

Sample Statements:

A. I listen carefully when the teacher is giving directions.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

B. I like to stand in the front of the class and act out skits or plays.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

Words of Encouragement: Take absolutely all the time you need, and do the very best you can. Have fun, relax, and enjoy learning more about yourself.

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1. I would rather build a project than read or write about a subject.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

2. I need clear directions that tell me what the teacher expects before I begin an assignment.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

3. I generate lots of unique or creative ideas.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

4. I memorize lots of facts and details when I study for a test.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

5. I feel better about an assignment when I double check my answers.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

6. I like to take things apart to see how they work.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

7. I am interested in detailed information about whatever I am studying.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

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8. I like to come up with a totally new and different way of doing an assignment instead of doing it the same way as everybody else.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

9. I prefer to take a paper and pencil test to show what I know.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

10. I keep a neat notebook, desk, or work area.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

11. I like to work with hand tools, power tools, and gadgets.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

12. I am willing to risk offering new ideas even in the face of discouragement.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

13. I need to have a complete understanding of the directions before I feel comfortable doing an assignment.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

14. I find that reading information is my favorite way to learn a subject.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

© Johnston & Dainton, 1995.

15. I like hands-on assignments where I get to use mechanical/technical equipment.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

16. I become frustrated when I have to wait for the teacher to finish giving directions.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

17. I prefer to build things by myself without anyone's guidance.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

18. I become frustrated if directions are changed while I am working on the assignment.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

19. I keep detailed notes so I have the right answers for tests.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

20. I don't like having to do my work in the way the teacher says, especially when I have a better idea I would like to try.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

21. I clean up my work area and put things back where they belong without being told to do so.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

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22. I enjoy the challenge of fixing or building something.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

23. I react quickly to assignments and questions without thinking through my answers.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

24. I enjoy researching and writing factual reports.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

25. I ask more questions than most people because I just enjoy knowing things.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

26. I like to figure out how things work.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

27. I am told by others that I am very organized.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

28. I like to make up my own way of doing things.

NEVER EVER	ALMOST NEVER	SOME-TIMES	ALMOST ALWAYS	ALWAYS

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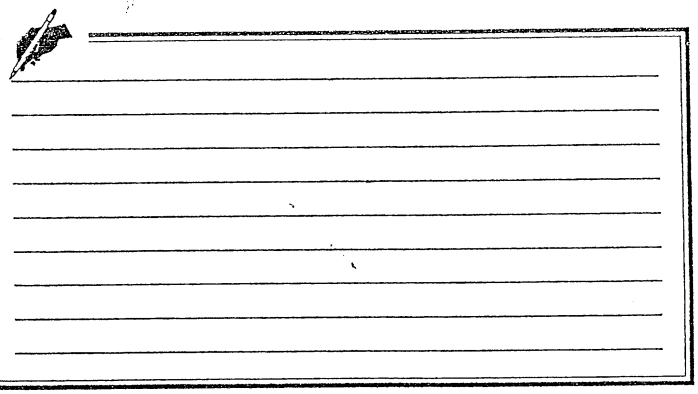
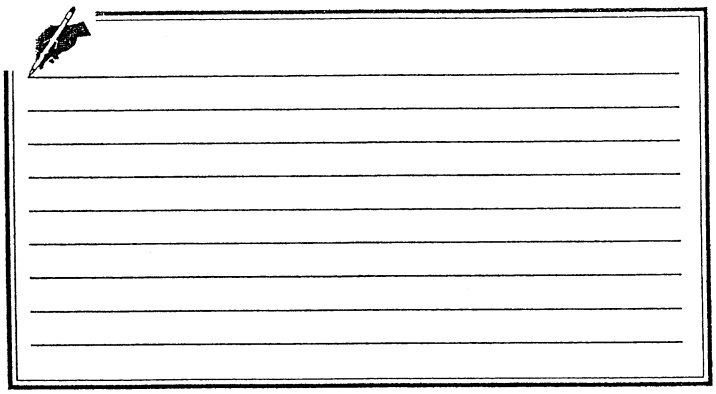
Part II: Please answer each of the following questions in your own words.

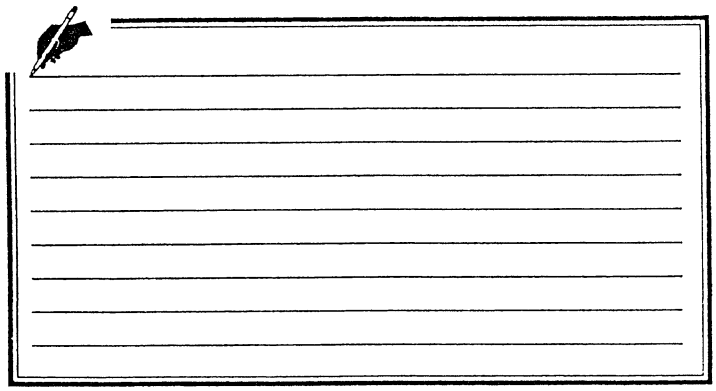
What makes assignments frustrating for you?



If you could choose, what would you do to show what you have learned?



What has been your most memorable learning experience? What made it memorable and meaningful for you?



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SCORING SHEET

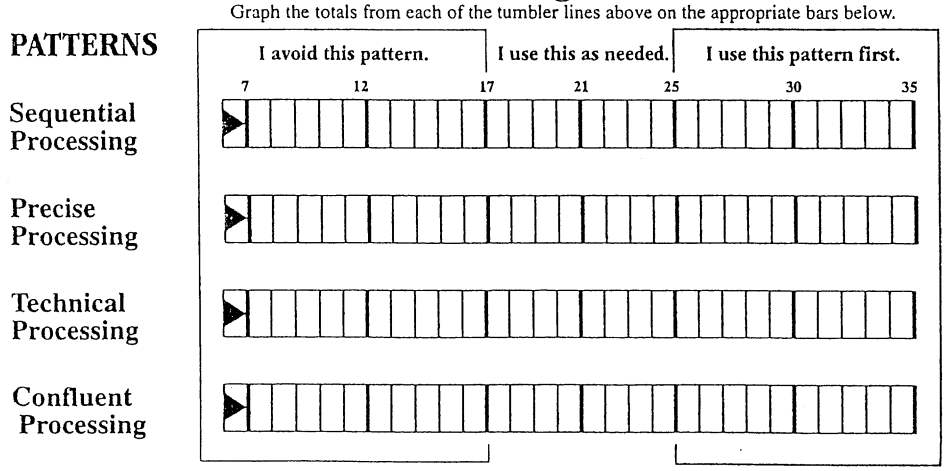
Name_____

Score the responses for Questions 1 - 28 using a 1 for "never ever," 2 for "almost never," 3 for "sometimes," 4 for "almost always," and 5 for "always." Next, transfer the score of each response to the center of the corresponding tumbler. Add up the tumbler numbers and write the total in the space at the end of each line. Transfer your total for each pattern to the bar graph at the bottom of the page.

PATTERNS	2	5	10	13	18	21	27	TOTAL
Sequential Processing								_____
	4	7	9	14	19	24	25	
Precise Processing								_____
	1	6	11	15	17	22	26	
Technical Processing								_____
	3	8	12	16	20	23	28	
Confluent Processing								_____

Your Learning Combination

Graph the totals from each of the tumbler lines above on the appropriate bars below.



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APPENDIX E

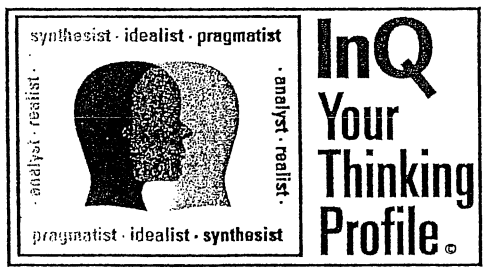
The Inquiry Mode Questionnaire

InQ

ASSESSING YOUR THINKING PROFILE

a self-help guide
to understanding
the way you think

When how you think is as important as how you relate.



InQ Educational Materials, Inc.
P.O. Box 13306, Montclair Station
Oakland, CA 94661-0306. U.S.A.

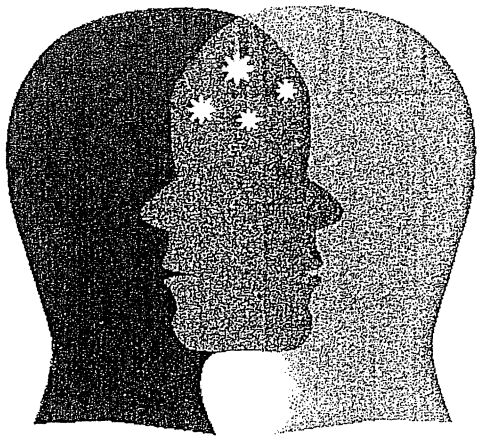
Telephone, toll free (U.S.A. and Canada): 1-888-339-2323
Fax: 1-510-339-6729

Web site: www.YourThinkingProfile.com
E-mail: Paul@YourThinkingProfile.com

Item #3001

In our research, we have identified five distinct styles of thinking.

How you think affects everything you do:
- how you look at life;
- how you interact with others;
- how you approach challenges;
- how you make decisions;
- how you ask questions;
- what you say and how you say it.



5 different ways of thinking;
5 different approaches to how things are done.

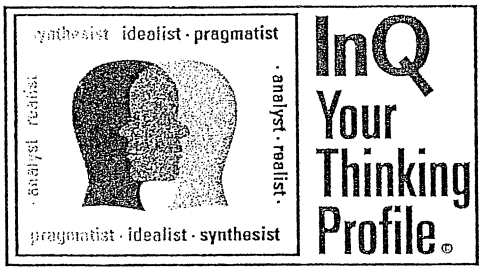
None is *right* or *wrong*.
It is a matter of understanding your style
and learning how to work with it.

So,

What is your style of thinking?
How do you determine what someone else's is?
How do you interact with others' styles effectively?

This self-assessment process is designed to help you answer those questions. It can be of great help to you in your personal or professional self-development efforts.

Contents **Page**



INQUIRY MODE QUESTIONNAIRE
A Measure of How You Think and Make Decisions
By Allen F. Harrison, D.P.A., Robert M. Bramson, Ph. D., Susan Bramson, and Nicholas Parlette, M.P.H.

DIRECTIONS AND EXAMPLE TEST ITEM

This questionnaire has no right or wrong answers. It is a tool that can help you identify your preferred modes of thinking, of asking questions, and of making decisions. To be of maximum value to you, it is important that you respond in the way you believe you actually behave, not as you think you should. Please allow yourself 20 to 30 minutes of uninterrupted time for the most reliable results.

Each item in this checklist is made up of a statement followed by five possible endings. Indicate the order in which you believe each ending applies to you. In the blank box provided to the left of each ending, fill in the number 5, 4, 3, 2 or 1, indicating the degree to which an ending is more like you (5) or least like you (1). Do not use any number more than once for any group of five endings. Even if two or more endings seem equally like you, rank them anyway. Each ending must be ranked with either a 5,4,3,2 or 1.

EXAMPLE TEST ITEM

Remember, a "5" is "most like you"; a "1" is "least like you."
WHEN I READ A REPORT, I AM MOST LIKELY TO PAY ATTENTION TO:

- ☐ The quality of the writing.
- ☐ The main ideas in the report.
- ☐ The table of contents.
- ☐ The back-up materials and tables.
- ☐ The findings and recommendations.

Once you are sure you understand the directions above,
please turn the page and proceed.

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After all 18 items have been completed, fold page 5 at perforation line and detach

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2

Item One (1) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
WHEN I HEAR PEOPLE ARGUE OVER AN IDEA, I TEND TO FAVOR THE SIDE THAT:

- ☐ Identifies and tries to bring out the conflict.
- ☐ Best expresses the values and ideals involved.
- ☐ Best reflects my personal opinions and experience.
- ☐ Approaches the situation with the most logic and consistency.
- ☐ Expresses the argument most forcefully and concisely.

Item Two (2) of eighteen. Forced choice: Mark blanks all from a "5" for most like you to a "1" for least like you.
WHEN I BEGIN WORK ON A GROUP PROJECT, WHAT IS MOST IMPORTANT TO ME IS:

- ☐ Understanding the purposes and values of the project.
- ☐ Discovering the goals and values of the individuals in the group.
- ☐ Determining the steps to be taken to get the project done efficiently.
- ☐ Understanding how the project will pay off for myself and others.
- ☐ Getting the project organized and under way.

Item Three (3) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
GENERALLY SPEAKING, I ABSORB NEW IDEAS BEST BY:

- ☐ Relating them to current or future activities.
- ☐ Applying them to concrete situations.
- ☐ Concentration and careful analysis.
- ☐ Understanding how they are similar to familiar ideas.
- ☐ Contrasting them to other ideas.

Item Four (4) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
FOR ME, THE BACK-UP DATA IN A BOOK OR REPORT ARE USUALLY:

- ☐ Very important if they demonstrate the truth of the findings.
- ☐ Important only for checking on the accuracy of the facts that are cited.
- ☐ Useful if supported and explained by the narrative.
- ☐ Important only in terms of the conclusions to be drawn from them.
- ☐ No more or no less important than the narrative.

Item Five (5) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
IF I WERE PUT IN CHARGE OF A PROJECT, I WOULD PROBABLY START BY:

- ☐ Trying to fit the project into broad perspectives.
- ☐ Deciding how to get it done with the available time and money.
- ☐ Speculating about what the possible outcomes might be.
- ☐ Determining whether or not the project should be done at all.
- ☐ Trying to formulate the problem as thoroughly as possible.

Item Six (6) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
IF I WERE ASKED TO GATHER INFORMATION FROM PEOPLE, I WOULD PREFER TO:

- ☐ Form my own opinion on the facts and issues and then ask specific questions.
- ☐ Hold an open meeting and ask them to air their views.
- ☐ Interview them in small groups and ask general questions.
- ☐ Meet informally with key people to get their ideas.
- ☐ Ask them to give me their information in writing.

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After all 18 items have been completed, fold page 7 at perforation line and detach

Item Seven (7) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
I AM LIKELY TO BELIEVE THAT SOMETHING IS TRUE IF IT:

- ☐ Has held up against opposition.
- ☐ Fits in well with other things that I hold to be true.
- ☐ Has been shown to hold up in practice.
- ☐ Makes sense logically and scientifically.
- ☐ Can be personally verified by observable facts.

Item Eight (8) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
I CAN CONTRIBUTE THE MOST WHEN I AM ASKED TO:

- ☐ Identify the goals and objectives of a project.
- ☐ Identify priorities between competing projects.
- ☐ Identify how to save time and money on a project.
- ☐ Identify the practical effects of a project.
- ☐ Identify and assign the resources needed to carry out a project.

Item Nine (9) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
WHEN I READ A NON-FICTION BOOK I PAY MOST ATTENTION TO:

- ☐ The relationship of the conclusions to my own experiences.
- ☐ Whether or not the recommendations can be accomplished.
- ☐ The validity of the findings, backed up by data.
- ☐ The author's understanding of goals and objectives.
- ☐ The inferences that are drawn from the data.

Item Ten (10) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
WHEN I HAVE A JOB TO DO, THE FIRST THING I WANT TO KNOW IS:

- ☐ What the best method is for getting the job done.
- ☐ Who wants the job done, and when.
- ☐ Why the job is worth doing.
- ☐ What effect it may have on other jobs that have to be done.
- ☐ What the immediate benefit is for doing the job.

Item Eleven (11) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
I USUALLY LEARN THE MOST ABOUT HOW TO DO SOMETHING NEW BY:

- ☐ Understanding how it is related to other things I know.
- ☐ Starting in to practice it as soon as possible.
- ☐ Listening to differing views about how it is done.
- ☐ Having someone show me how to do it.
- ☐ Analyzing how to do it in the best way.

Item Twelve (12) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
IF I WERE TO BE TESTED, I WOULD PREFER:

- ☐ An objective, problem-oriented set of questions on the subject.
- ☐ A debate with others who are also being tested.
- ☐ An oral presentation covering what I know.
- ☐ An informal report on how I have applied what I have learned.
- ☐ A written report covering background, theory, and method.

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After all 18 items have been completed, fold page 9 at perforation line and detach

Item Thirteen (13) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
PEOPLE WHOSE ABILITIES I RESPECT THE MOST ARE LIKELY TO BE:

- ☐ Philosophers and consultants.
- ☐ Writers and teachers.
- ☐ Business and government leaders.
- ☐ Economists and engineers.
- ☐ Entrepreneurs and journalists.

Item Fourteen (14) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
GENERALLY SPEAKING, I FIND AN IDEA USEFUL IF IT:

- ☐ Fits in well with ideas that I have learned.
- ☐ Explains things to me in a new way.
- ☐ Can systematically explain a number of related situations.
- ☐ Serves to clarify my own experiences and observations.
- ☐ Has a practical and concrete application.

Item Fifteen (15) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
WHEN SOMEONE MAKES A RECOMMENDATION, I PREFER THAT HE OR SHE:

- ☐ Shows clearly what benefits will be realized.
- ☐ Shows how the recommendation can be implemented.
- ☐ Backs up the recommendation with data and a plan.
- ☐ Shows how the recommendation will support overall goals.
- ☐ Takes into account the drawbacks as well as the benefits.

Item Sixteen (16) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
I WOULD MOST LIKELY READ A BOOK ON AN UNFAMILIAR TOPIC BECAUSE OF:

- ☐ An interest in improving my technical knowledge.
- ☐ Having been told it would be useful, by someone I respect.
- ☐ A desire to know more about how others think.
- ☐ A desire to find ideas that would challenge me.
- ☐ A wish to learn if the specific subject could benefit me.

Item Seventeen (17) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
WHEN I FIRST APPROACH A PROBLEM, I AM MOST LIKELY TO:

- ☐ Try to relate it to a broader problem or theory.
- ☐ Look for ways to get the problem solved quickly.
- ☐ Think of a number of opposing ways to solve it.
- ☐ Look for ways that others might have solved it.
- ☐ Try to find the best procedure for solving it.

Item Eighteen (18) of eighteen. Forced choice: Mark all blanks from a "5" for most like you to a "1" for least like you.
GENERALLY SPEAKING, I AM MOST INCLINED TO:

- ☐ Find existing methods that work, and use them as well as possible.
- ☐ Speculate about how dissimilar methods might work together.
- ☐ Strive for quality regardless of the cost.
- ☐ Look for new ways to do things.
- ☐ Be dissatisfied until I have found the best method.

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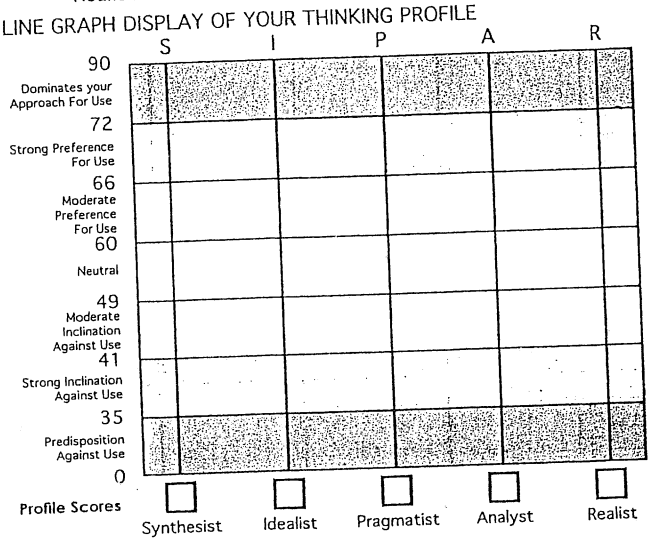
YOUR THINKING PROFILE
A. SCORES AND LINE GRAPH DISPLAY

Date of assessment _____

SCORES, YOUR STYLES OF THINKING, FOR (name) _____

Synthesist score ☐
Idealist score ☐
Pragmatist score ☐
Analyst score ☐
Realist score ☐

LINE GRAPH DISPLAY OF YOUR THINKING PROFILE



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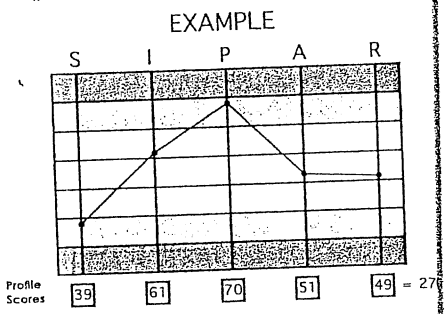
EXAMPLE



Enter your numerical score for each Style with a dot at the approximate spot on the appropriate vertical line. Then connect the dots to form a line graph (see EXAMPLE).

B. INTERPRETATION OF SCORES

IF YOU SCORED

72 or higher	This style dominates your approach to thinking.
66 to 71	You have a strong preference for the use of this style.
60 to 65	You have a moderate preference for the use of this style.
49 to 59	Neutral – you have no preference for, or inclination against this style.
41 to 48	You have a moderate inclination against the use of this style.
35 to 40	You have a strong inclination against the use of this style.
34 or lower	You have a predisposition against the use of this style

High scores 60 and above, show where your preferences lie. They identify the thinking strategies you have learned over time, and which you prefer to use because they work well for you. The higher the score, the stronger the preference.

Low scores 48 or below, identifies your areas of strategic thinking that are under-used or under-developed. The lower the score, the greater the tendency not to use this style, or the stronger the inclination against the use of it.

Combinations Although half of individuals score 60 and above in just one style, a few score that high in two, or even three, styles.

"Equal" scores If the difference between any two of your scores is less than 4 points, regard the styles as being somewhat equal. The differences are two small to attribute any significance to it.

Remember, there are no right or wrong styles. It is a matter of experience and preferences.
There are ways to modify styles that are too dominant for you (ahead).
There are ways to augment those styles that you wish to strengthen (ahead).

C. SUMMARY CHART, STYLES OF THINKING

Orientation	SYNTHESIST	IDEALIST	PRAGMATIST	ANALYST	REALIST
Characteristics	Integrative view. Seeks conflict and synthesis. Interested in change. Speculative.	Holistic view. Seeks ideal solutions. Interested in values. Receptive.	Eclectic view. Seeks shortest route to payoff. Interested in innovation. Adaptive.	Deductive view. Seeks "one best way" Interested in "scientific solutions." Prescriptive.	Empirical view. Seeks solutions that meet current needs. Interested in concrete results. Corrective.
Strengths	Focus on underlying assumptions Points out abstract, conceptual aspects. Good at preventing over-agreement. Best in controversial situations. Provides debate and creativity.	Focus on process and relationships. Points out values and aspirations. Good at articulating goals. Best in value-laden situations. Provides broad view, goals, standards.	Focus on payoff. Points out tactics and strategies. Good at identifying impacts. Best in complex situations. Provides experiment and innovation.	Focus on method and plan. Points out data and details. Good at model-building, planning. Best in structured situations. Provides stability and structure.	Focus on facts and results. Points out realities and resources. Good at simplifying, "cutting through." Best in well-defined situations. Provides drive and momentum.
Liabilities	May screen out agreement. May seek conflict unnecessarily. May try too hard for change, newness. May theorize excessively. Can appear uncommitted.	May screen out "hard" data. May delay from too many choices. May try too hard for "perfect" solutions. May overlook details. Can appear overly sentimental.	May screen out long-range aspects. May rush too quickly to payoff. May try too hard for expediency. May rely too much on what "sells." Can appear over-compromising.	May screen out values. May over-plan, to over-analyze. May try too hard for predictability. May be inflexible, overly cautious. Can appear "tunnel" visional."	May screen out disagreement. May rush to over-simplified solutions. May try too hard for consensus. May over-emphasize perceived "facts." Can appear too results-oriented.
Behavioral cues					
Apt to appear	Challenging, skeptical, amused.	Attentive, receptive, supportive.	Open, sociable, humorous.	Cool, studious, hard to read.	Direct, forceful; quick non-verbal expression.
Apt to say	"On the other hand." "No, not necessarily."	"It seems to me." "Don't you think."	"I'll buy that." "That's one sure way."	"It stands to reason." "Logically,"	"It's obvious to me." "Everybody knows That."
Apt to express	Concepts, opposite points of view.	Feelings, ideas about values, what's good.	Non-complex ideas, personal anecdotes.	General rules, supporting data.	Opinions, factual anecdotes.
Tone	May sound argumentative, sardonic.	May sound tentative, hopeful, resentful.	May sound insincere, enthusiastic.	May sound stubborn, careful, dry.	May sound dogmatic forthright, positive.
Enjoys	Intellectual, philosophical, arguments.	Feeling-level discussions.	Brainstorming, lively give-and-take.	Rational examination of issues.	Short, direct, factual discussions.
Apt to use	Parenthetical expressions, qualifying phrases.	Indirect questions, aids to agreement.	Case examples, illustrations, popular opinions.	Long, discursive, well-formulated sentences.	Direct, pithy, descriptive statements.
Dislikes	Talk that seems simplistic, superficial, mundane.	Talk that seems too factual, too conflictive, dehumanizing.	Talk that seems dry, dull, humorless, "nit-picking."	Talk that seems irrational, aimless, "far out."	Talk that seems too theoretical, sentimental, impractical.
Under stress	Pokes fun.	Looks hurt.	Looks bored.	Withdraws.	Becomes agitated.

SUMMARY DESCRIPTION OF THE FIVE STYLES

Synthesist

Synthesists tend to be challenging people – curious, restless, and creative. The are motivated to understand, but not necessarily control, the world, and are muc concerned that others see them as competent and worthy of admiration. They can b negative and disruptive, argumentative and rambling, as they try to integrate differen perspectives.

Idealist

Idealists tend to expect much of themselves and others. At the same time, their deepl felt needs to be helpful to others, to be appreciated, and to be found worthy of trus make **Idealists** frequently very supportive and helpful to others. They can be so helpf that, occasionally, they are just plain meddlesome.

Pragmatist

Pragmatists are likely to be good at knowing what people will "buy." They can afford t approach problems in innovative or compromising ways because they have no veste interests in particular theories or methods. They provide optimism and enthusiasm th motivates people to move ahead even when the task seems mountainous. Because the don't need to take on the whole world at once, **Pragmatists** often have a high toleranc for ambiguity. They need less structure and predictability than the rest of us.

Analyst

Analysts view the world on an assumption that it is basically orderly, logical, and ration If it isn't, it should be, and Analysts will do their best to make it so. Within this worl they have a need to feel competent and self-sustaining. **Analysts** believe that "so lo as we proceed carefully and methodically, things will work out." They are intereste above all else, in finding the correct method for getting something done. **Analysts** a apt to look for, or already "know," the "one best way" to solve a problem.

Realist

Realists tend to view the world empirically – whatever can be seen, felt, heard, smelle and experienced is vividly real. Anything else is somewhat fanciful, theoretical, and r very compelling. **Realists** assume that the world is as they sense it, that the facts a there for everyone to see, and that any two intelligent people can't help but agr on these facts. In that respect, **Realists** are quite the opposite of **Synthesists**. Th are bothered by compromise, synthesis, analysis, and idealism. They want to achie concrete results. Nothing else can influence the course of their "real world."

COMBINATIONS OF STYLES

Our research shows that about 35 percent of people show a preference for usin two or more thinking styles in combinations: not as a blend but rather using one wit another, for whatever reasons. The three most common combinations are:

Idealist-Analyst
Analyst-Realist
Synthesist-Idealist

The least common are the *Synthesist* in combination with the *Pragmatist*, *Analyst*, *Realist*.

What is important to remember is that all combinations can create some element internal conflict within the person, when the contrasting values are brought togethe and all can be of great value when the complementary values are emphasized.

Three-way thinkers are likely to behave more situational, since they can employ greater range of strategies.

Level-profiles, in which all scores fall between **49** and **59**, tend to be less predictab than others. They tend to look at things differently, depending on the situation.

E. AUGMENTING YOUR STYLE

If you discover that you are "too low" in a particular style of thinking, or that a style in which you are low places you at a disadvantage with others, you may want to strengthen it. Here are some ways of doing that.

TO STRENGTHEN THE SYNTHESIST IN YOU,

- Cultivate the *third-party observer* viewpoint. Learn to pull out of the action now and then. Ask yourself, "What's going on here?" "What role am I playing in this?"
- Practice *negative analysis*. Develop the habit of asking, "What will go wrong?" if a perfectly obvious and rational solution is implemented.
- Take the *devil's-advocate* approach sometimes when you don't have the answers or the facts. Even when you do, cultivate the speculative art of asking, "What if...?"

TO STRENGTHEN THE IDEALIST IN YOU,

- Listen for *value statements*. Practice listening for emotional undertones and overtones. Suspend judgment when someone seems to be irrationally sentimental or idealistic.
- Force yourself to assume there is not necessarily *"one best way"* to solve a problem. Rather than rushing ahead and plotting a linear path, look at all the many alternatives that others might suggest.
- Understand that all situations are not necessarily resolved logical or objectively. Allow *intuitive judgments* to rule in low-risk situations.

TO STRENGTHEN THE PRAGMATIST IN YOU,

- Practice looking for the *short-range payoff*. In low-risk situations, control your caution or idealism.
- Learn to think in terms of *what can benefit whom*, and what people will "buy." Think about survival now and then, instead of goals and objectives.
- Learn to *think tactically*. Practice trying to figure out what others might be likely to do in order to counter your tactics.

TO STRENGTHEN THE ANALYST IN YOU,

- *Pay greater attention to detail*. Proof read everything you write, carefully. Learn to double-check any calculations you make, no matter how boring the task.
- Be aware that *many people need structure, logic, and direction*, even though you may prefer to "wing it."
- When you begin to plan for a project, ask yourself first, *"What's good about the old way?"*

TO STRENGTHEN THE REALIST IN YOU,

- Force yourself to *be specific*. When you are trying to explain a theory or an idea, give an example or two. *Learn to ask others for examples*, too, when they seem to assume you understand their abstractions.
- Practice giving a report or a recommendation as *succinctly and straightforwardly* as possible. If you have a lot of background data, alternatives, or plans, keep them back until they are asked for.
- Next time you read a long report, *summarize it into three or four points*.

Note: To learn more about augmenting, visit our web site Catalog of Materials and look for **Item #3002, Modifying and Augmenting Your Thinking Profile**, for individual use, and for **Item #3020, Workbook for Modifying Your Thinking Profile**, for team use.

F. IMPLICATIONS FOR WORKING WITH, AND INFLUENCING, OTHERS

Now that you have a good understanding of your style of thinking, consider the ways of working more effectively with, and of influencing, others. If they have done their own self-assessments of thinking styles, as you have, find out how they scored so that you can be certain of their styles. This will be much easier to do if your team members do it together, in a team-development workshop setting. If not, you will need to try determining their styles by the things they say and do, by listening and observing. Here are some ways of working more effectively with others, and influencing them.

IF THE OTHER IS A SYNTHESIST,

- *Don't interpret argument as disagreement*; look at it as a useful exploration of th problem.
- *Be ready to ask specifying questions*: "Can you give me an example of that?"; "Hc would we say that in a report?"
- *Use active, unstructured methods* for developing ideas, such as "brainstorming."

IF THE OTHER IS AN IDEALIST,

- *Appeal to high standards*, the quality of the plan, the benefits to be gained by other
- *Be alert that open conflict may be postponed* even at the expense of gaining t best solution to the problem.
- *Tap his or her developmental strength*: "Can you help me with this problem?"

IF THE OTHER IS A PRAGMATIST,

- Keep in mind that you need to *show some short-range benefits* and an incremer way of going from where you are to where your goal is.
- *Be prepared to bargain*, negotiate, and/or collaborate, especially in conflict situatio
- *Listen through the humor and light touches*; they may contain "messages."

IF THE OTHER IS AN ANALYST,

- *Don't interpret lack of response as disapproval.*
- Do your homework. *Be ready for fact-oriented, hard questions.*
- Provide as much time as possible for Analysts *to review and digest data or plans t* will need their approval or commitment.

IF THE OTHER IS A REALIST,

- *Assign work to Realists that needs to be done quickly or forcefully.*
- *Lay out your plan quickly* – the "meat" of it —in the first few paragraphs. Conne to the attainment of immediate objectives.
- *Respond rapidly to requests, with an action plan you can keep to.* A quickly postpc deadline is better than even a brief over run of the deadline.

Note: To learn more about working with and influencing others, visit our web site Cata of Materials and look for **Item #3003, Recognizing Others' Thinking Profiles, and Influenc Them**, for individual use, and for **Item #3021, Workbook for Recognizing Others' Think Profiles**, for team use.

REFERENCES*

Bruner, Jerome; Goodnow, Jacqueline; and Austin, George A. *A Study of Thinking*. New York: Science Editions, 1957.

Bruvold, William; Parlette, Nicholas; Bramson, Robert M.; and Bramson, Susan. "An Investigation of the Item Characteristics, Reliability, and Validity of the Inquiry Mode Questionnaire," *Educational and Psychological Measurement*, 43 (1983).

Chao, Li, and Huang, Jianyi. "Thinking Styles of School Teachers and University Students in Mathematics." *Psychological Reports*, December 2002, 91 (3 Pt1), 931-934.

Churchman, C. West, *The Design of Inquiring Systems*. New York: Basic Books, 1971.

Cooke, R.A.; Rousseau, D.M.; and Lafferty, J.C. "Thinking and Behavioral Styles: Consistency Between Self-Descriptions and Descriptions by Others." *Educational and Psychological Measurement*, 47 n3, 815 - 819. (1987).

DeBono, Edward, *Lateral Thinking*. New York: Harper & Row, 1972.

Diekelmann, N.L., and Rather, M.L. *Transforming Rn Education: Dialogue and Debate*. Sudbury, MA: Jones and Bartlett Publishers. (includes article on nurses' thinking styles by Alice Keinholtz) 1993.

Golian, L. M. Thinking Style Differences Among Academic Librarians. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 59(7-A), January, 1999, 2231.

Harrison, A.F., and Bramson, R.M. *Styles of Thinking*. New York: Doubleday, 1982.

Harrison, A.F., and Bramson, R.M. *The Art of Thinking: The Classic Guide to Increasing Brain Power*. New York: Berkley Publishing Company (reprinted), 2002).

Jones, T., and Groff, T. *Introduction to Knowledge Management: Km in Business*. Boston, MA: Elsevier Science, 2003.

Klein, George. *Perception, Motives, and Personality*. New York: Alfred A. Knopf, 1970.

McKenny, J., and Keen, P. *"How Managers' Minds Work,"* Harvard Business Review, 52:3.

Mitroff, Ian I., and Pondy, Louis R. *"On the Organization of Inquiry," Public Administration Review*, (September/October 1974).

Parlette, N., and Rae, R. "Thinking About Thinking. (thinking styles of people, includes related article: "Leadership: An Association Management Supplement for Volunteer Leaders"). *Association Management*, 45 n1, pL70(5), January, 1993.

Zhang, L. "Thinking Styles: Their Relationships With Modes of Thinking and Academic Performance." *Educational Psychology*, 22, 3, 331-348, June, 2002.

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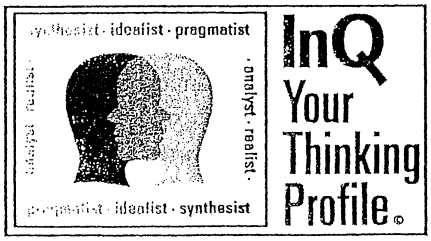
WHY YOUR InQ THINKING PROFILE IS DIFFERENT

SOME DISTINGUISHING CHARACTERISTICS

1. It differs from other instruments in that it deals primarily *with styles of thinking* and *cognition* rather than such *affective* traits as *attitudes* and *feelings*. It is particularly useful where decisions are complex and diversity of approach is a recognized need.
2. It measures *thinking* rather that *personality*; therefore it can be used compatibly with many other assessment instruments.
3. It is non-threatening in that the data are derived by oneself, rather than being dependent on directions from a trainer or unsolicited feedback from colleagues.
4. It is easy to assess oneself, needing only 20 to 30 minutes of uninterrupted time for completion. In addition, it is easy to use in group training sessions, where a longer time can be taken for participatory learning processes.
5. It has a high degree of acceptance from those who may be uncomfortable with other instruments that expose inner feelings or hidden motives.
6. It has been proven to be a cost-effective, well-accepted, self-development tool, with a rapid training payoff.
7. It has had extensive field-testing and analysis, demonstrating validity and reliability suitable for counseling and research.

SOME COMMON USES FOR YOUR InQ THINKING PROFILE

1. In broadening and deepening individual competencies in thinking, problem solving, and influencing others.
2. In team building, where the process has proven to be a non-threatening way of identifying collaborative resources.
3. In coaching and counseling, where others can be helped in strengthening under-used strategies and modifying those that are over-used.
4. In the selection of key personnel, especially for the introduction of special thinking styles that enable teams and organizations work more effectively.
5. In matching persons to projects, where thinking styles and experiences can be applied to tasks appropriately.



InQ Your Thinking Profile®

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