

LEARNING STYLES: DIFFERENCES IN UNDERGRADUATE VERSUS
GRADUATE ENTRY LEVEL ATHLETIC TRAINING STUDENTS

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MASTER OF SCIENCE

Advanced Athletic Training

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ABSTRACT

The purpose of this study was to determine the preferred learning style of undergraduate and graduate entry level athletic training students. This study also investigated the preference of males and females in both groups. Marshall and Merrit's Student Learning Style Questionnaire (1986) based on Kolb's theory was used to survey 429 undergraduate and 69 graduate students. The preferred learning style of undergraduate entry level athletic training students was Diverger, which was the same as the graduate students, and males and females of each group. There was no significant difference of preferred learning style between undergraduate and graduate students or between the males and females. Using the Chi-Square goodness of fit test, it was concluded that the Diverger learning style was preferred by undergraduate and graduate entry level athletic training students and was statistically significant.

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TABLE OF CONTENTS

ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	vii
LIST OF FIGURES	viii
LIST OF APPENDIX TABLES	ix
CHAPTER 1. INTRODUCTION	1
Statement of the Problem	6
Research Questions	6
Significance of Study	6
Definitions of Terms.....	7
CHAPTER 2. REVIEW OF LITERATURE.....	9
Kolb’s Experiential Learning Theory.....	10
Development of Learning Styles.....	13
Classification of Learners.....	15
Learning Styles in Athletic Training and Other Allied Health Professions	20
Summary.....	22
CHAPTER 3. METHODS.....	26
Population Sample and Sampling Procedures.....	26
Survey/Questionnaire	27

Procedures	28
Analysis	29
CHAPTER 4. RESULTS.....	30
Demographics of Undergraduate Students.....	31
Demographics of Graduate Students.....	34
CHAPTER 5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS.....	42
Discussion.....	42
Recommendations	46
Conclusion.....	47
REFERENCES	48
APPENDIX 1. IRB APPROVAL	50
APPENDIX 2. LETTER OF PERMISSION.....	51
APPENDIX 3. ORIGINAL SURVEY	52
APPENDIX 4. PROGRAM DIRECTOR EMAIL	54
APPENDIX 5. STUDENT EMAIL.....	55
APPENDIX 6. REMINDER EMAIL	56
APPENDIX 7. SURVEY DISTRIBUTED	57
APPENDIX 8. FUNDING EMAIL	62
APPENDIX 9. UNDERGRADUATE INSTITUTIONS.....	63
APPENDIX 10. GRADUATE INSTITUTIONS	66

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Learning Styles and Modes.....	19
2. Undergraduate Students' Age.....	31
3. Graduate Students' Age.....	35
4. Graduate Students' Undergraduate Major.....	36

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Kolb’s Model of Learning Styles.....	3
2. Kolb’s Experiential Learning Cycle	12
3. Kolb’s Model of Learning Styles.....	17
4. Undergraduate Class	32
5. Undergraduate Degrees.....	32
6. Undergraduate Semesters of Didactic Experience.....	33
7. Undergraduate Athletic Training Courses	33
8. Undergraduate Clinical Experiences.....	34
9. Graduate Degrees.....	35
10. Graduate Athletic Training Courses Completed.....	37
11. Graduate Clinical Experiences.....	38
12. Undergraduate Preferred Learning Styles.....	39
13. Graduate Preferred Learning Styles.....	40

LIST OF APPENDIX TABLES

<u>Table</u>	<u>Page</u>
1. Undergraduate Institutions.....	63
2. Graduate Institutions.....	66

CHAPTER 1. INTRODUCTION

Learning is a lifelong process that starts as young children and blossoms as we go through school. The Webster Dictionary (1996) definition of learning is “acquiring knowledge or a skill by studying or through experience” (p. 353). When an individual is going through higher education his/her learning is more focused on the studying part of the definition. But when acquiring this new information and processing it, does everyone’s brain commit it to memory the same way? The answer is no. There are optimal ways that each individual is able to understand different concepts. Since learning continues even after graduation, experiences that an individual has becomes the dominant way to acquire knowledge once he/she leaves the classroom. Out in the workforce and in everyday life, people’s experiences contribute to learning new things and will continue until the end of their life.

Just like different personalities or fingerprints, everyone has different styles of learning. Kolb (1985) defined four types of learning modes: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC) and Active Experimentation (AE). The four different combinations of these learning modes (Converger, Diverger, Assimilator, and Accommodator) make up Kolb’s learning styles.

A Concrete Experience (CE) learner relies more on an experience-based approach, paying much attention to “feeling based” judgments (Kolb, 1985). These individuals tend to be empathetic and people oriented. Specific opportunities in which they can be actively involved are good for these people as well. Concrete Experience based individuals tend to do well with peer learning and have less interest in a teacher directed learning experience. In Abstract Conceptualization (AC) the learner uses an analytical approach and relies on logical thinking and rational evaluation. Situations that are impersonal and emphasize theory and systematic analysis

are good for the Abstract Conceptualization learner. They also benefit from very structured learning opportunities. An Active Experimentation (AE) learner tends to take after their name—they do well with “doing” tasks. They are the hands-on learners who do not like passive learning situations and are considered extroverts (Kolb, 1985). Reflective Observers (RO) are tentative and show an impartial approach to their learning. Observations are the way these learners take in new information and are best able to process this way. Unlike the Active Experimentation learners, Reflective Observers tend to be introverts (Kolb, 1985).

Much like personality traits, learning styles are usually a combination of these different modes. An Abstract Conceptualization (AC) and Active Experimentation (AE) combination is known as a Converger. Practical applications are his/her strengths. If there is a specific solution to a problem, he/she seems to be able to focus better than if there are multiple solutions. Working mainly in areas like the physical sciences, engineering and computer sciences, a Converger tends to show more interest in working with unemotional things instead of people (Kolb, 1985).

A combination of Concrete Experience (CE) and Reflective Observation (RO) is known as a Diverger. His/her greatest strengths are within creativity and imagination. Brainstorming activities work well to bring out the best work in the Diverger. These individuals are socially oriented and tend to be emotional. They have a tendency to be interested in the arts and the humanities, or come from a liberal art background. Figure 1 illustrates Kolb’s learning modes and styles.

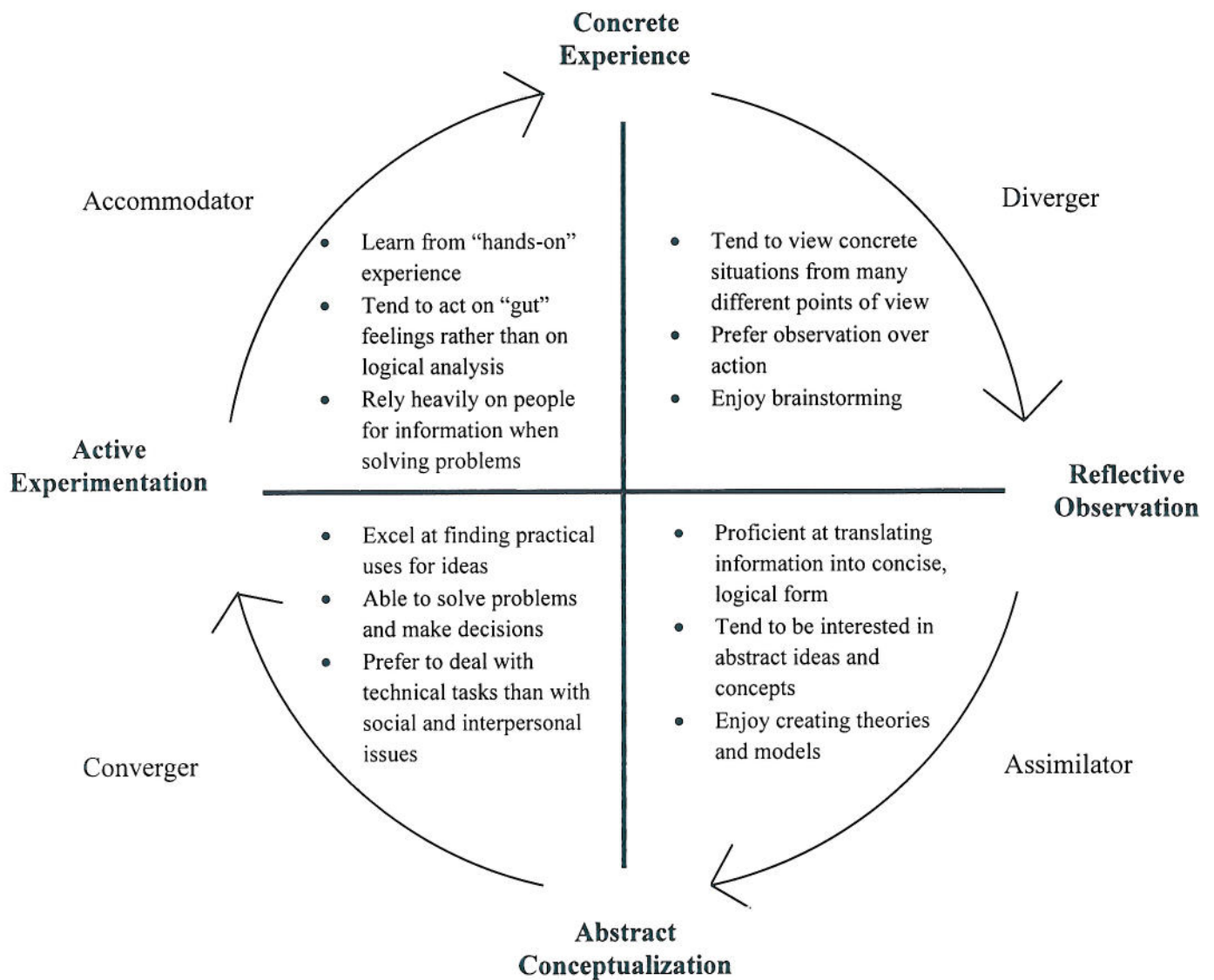


Figure 1. Kolb's Model of Learning Styles. Adapted from Kolb (1985).

Those who score highest in Abstract Conceptualization (AC) and Reflective Observation (RO) are known as Assimilators. These people tend to be strongest in creating theories and their ability to understand concepts. Taking many ideas and putting them together to create one big idea works well for them. Like Convergers, Assimilators are more interested in concepts instead of people. Individuals in the fundamental sciences such as chemistry, physics, and mathematics rather than the applied sciences such as engineering tend to fit this category, and are very often involved in careers in research and planning.

The last combination of learning modes is between the Concrete Experience (CE) and Active Experimentation (AE). They are known as an Accommodator. The Accommodator is a polar opposite from an Assimilator and excels in thinking on his/her feet, and is known as a risk taker. If the theory he/she is working with does not fit the facts, he/she tends to quickly disregard it and move onto something else. Trial-and-error solutions are usually used when trying to solve new problems. An Accommodator is at ease with social interactions, but sometimes can be classified as being “pushy”. They will be found in more action oriented jobs like nursing, teaching and sales (Kolb, 1985). In order to help classify which learning styles are preferred by athletic training students’, the profession itself should be understood first.

The National Athletic Trainers’ Association or NATA (2010) defines an athletic trainer as a “health care professional who collaborates with physicians to optimize patient and client activity and participation in athletics, work and life”. The profession of athletic training “encompasses the prevention, diagnosis and intervention of emergency, acute, and chronic medical conditions involving impairment, functional limitations, and disabilities” (NATA, 2010). In order to do this, the individual must pass the Board of Certification (BOC), Inc. test to become certified. In order to sit for this exam, the person must have graduated from a Commission on Accreditation of Athletic Training Education (CAATE) entry level program. This can be completed in an undergraduate or graduate program (NATA, 2010). Both programs are considered entry level in the athletic training profession (NATA, 2010). An undergraduate program is traditionally a four-year program with both didactic and clinical experiences. In a graduate program, there is a didactic component as well, and the clinical experiences need to be completed in a minimum of two academic years (CAATE, 2010). A requirement of the graduate program is that the individual also has acquired a Bachelor of Science (BS) or Bachelor of Arts

(BA) degree. Both programs follow a competency-based education model. According to the 4th edition of the NATA Athletic Training Educational Competencies, students are educated to provide comprehensive preventative services and care in 12 domains of clinical practice: risk management and injury prevention, pathology of injury and illness, orthopedic clinical exam and diagnosis, general medical conditions and disabilities, acute care of injuries and illnesses, therapeutic modalities, conditioning and rehabilitation exercise, pharmacology, psychosocial intervention and referral, nutritional aspects of injury and illness, health care administration, and professional development and responsibilities (NATA, 2010). The goal of both programs is to prepare the student to become an Athletic Trainer. According to the BOC, (2010) students need to earn a degree from a college or university with an accredited athletic training program and pass a written examination to be credentialed. More colleges and universities are moving from an undergraduate to a graduate program format (CAATE, 2010).

Determining how these individuals learn would be a positive step in furthering today's education. If there is a difference in learning styles that was prominent during prior schooling for students at the graduate level, the athletic training program would be able to equip itself with professors who can mold their teaching styles to fit the needs of the students. There have been several studies done on the learning styles of undergraduate athletic training students (Coker, 2000; Harrelson, Leaver-Dunn, & Wright, 1998; Stradley, Buckley, Kaminski, Horodyski, Fleming, & Janelle, 2002), but as graduate programs are still fairly new, fewer studies have been done there. In order to continue building the profession of athletic training, educators want to be able to help students to best fulfill their lifelong learning skills in a way that will benefit everyone in the long run.

Statement of the Problem

Undergraduate students have fewer years of education than graduate students in entry level athletic training programs. In order to improve the education of these students it is beneficial to know if there are differences in their learning styles. Using Marshall and Merrit's Student Learning Style Questionnaire (1986), based on Kolb's theory, an idea of differences or similarities between these two groups of students may provide educators insight needed to improve their teaching methods.

Research Questions

1. What was the preferred learning style of undergraduate entry level athletic training students?
2. What was the preferred learning style of graduate entry level athletic training students?
3. Was there a significant difference in the preferred learning styles of undergraduate entry level athletic training students versus graduate entry level athletic training students?
4. Was there a significant difference in preferred learning styles between male and female undergraduate entry level athletic training students?
5. Was there a significant difference in preferred learning styles between male and female graduate entry level athletic training students?

Significance of Study

Since more entry level graduate athletic training programs are developing throughout the country, it is important for educators to know how to best accommodate the students. Does a student's educational background and how they learn help shape how they pick up athletic training principles? Does the students' learning styles change over time in school or do they tend to remain constant? Studies have been conducted (Draper, 1989; Harrelson, Leaver-Dunn &

Wright, 1998; and Stradley, 2002) on undergraduate student learning styles, so it would be interesting to see graduate students' results and if their learning styles change as they go through the program. By researching any differences in preferred learning styles between the undergraduate and graduate programs, athletic training educators will be able to change their teaching methods accordingly.

Definition of Terms

Athletic Training: Profession that encompasses the prevention, diagnosis, and intervention of emergency, acute, and chronic medical conditions involving impairment, functional limitations, and disabilities involved in sports medicine (NATA, 2010).

Commission on Accreditation of Athletic Training Education (CAATE): The CAATE is the agency responsible for accrediting athletic training educational programs (BOC, 2010).

Athletic Trainer: An allied health professional that has a bachelor's degree from an accredited college/university, has fulfilled his/her requirements for certification as established by the BOC, Inc. and has passed the BOC certification examination. Athletic trainers can teach in both the clinical and non-clinical setting (NATA, 2010).

Entry Level Graduate Program: CAATE accredited graduate education program that uses a competency-based approach in both the classroom and clinical settings (NATA, 2010).

Entry Level Undergraduate Program: CAATE accredited undergraduate education program that uses a competency-based approach in both the classroom and clinical settings (NATA, 2010).

Learning Styles: The way one prefers to absorb and incorporate new information to memory. This determines what kind of learning experience each type of learner will find effective, comfortable, and growth promoting (Kolb & Smith, 1996).

Student Learning Style Questionnaire: The learning style inventory developed by Jon C. Marshall and Sharon L. Merritt based on the Kolb Learning Style Questionnaire used to assess an individual's preferred learning style (Marshall & Merritt, 1986).

NATA: National Athletic Trainers' Association. The governing body for the athletic training profession (NATA, 2010).

Athletic Training Student: An individual who is fulfilling the requirements to sit for the certification exam (BOC, 2010).

CHAPTER 2. REVIEW OF LITERATURE

In athletic training, students can learn in two different environments. The first environment is the traditional classroom. They begin by learning about how the body works and the science of movement as well as the 12 domains of clinical practice. In risk management and injury prevention, students learn about different injuries. In pathology of injury and illness, different types of injury and illness are identified. Orthopedic clinical exam and diagnosis involves students learning about orthopedic injuries and how to examine a patient. In general medical conditions and disabilities students learn about skin conditions and basic internal issues. During acute care of injuries and illnesses the focus is on-field care. With therapeutic modalities; ultrasound, electric stimulation, and other modalities are discussed and the students learn to apply them to patients. Conditioning and rehabilitation exercise teaches rehabilitation programs for common injuries seen in the profession. Pharmacology is the study of drugs and their effect on patients. Psychosocial intervention and referral deals with conditions such as eating disorders or depression and how the student can be there for the patient or get them the help they need. The nutritional aspect of injury and illness domain goes over certain characteristics needed for a healthy lifestyle. Health care administration consists of skills like budget planning and insurance needed in the athletic training profession. Finally, professional development and responsibilities teach students about the National Athletic Trainers' Association and the history of the profession, along with other responsibilities like continuing education credits (NATA, 2010). From the classroom, students move into clinical rotations. When in clinicals, students apply what they have learned to real patients or situations acted out by their peers. These experiences prepare students for situations they will encounter in the workplace.

Athletic training educators should be aware of the fact that all students learn differently. Students may use one type of learning in the classroom, and a different one in the clinical setting. Each of these environments provides a different experience for the students. David Kolb, an American educational theorist, proposed that individuals learn through experience and developed his Experiential Learning Theory (Schellhase, 2006). Educators can use this theory to better connect and engage with their students in the learning process by providing different types of educational experiences to foster student success. This theory could also play a role on the learning styles of athletic training students during their years of education. The experience phenomenon comes into play when comparing the two types of athletic training students: entry level undergraduate and graduate students. These two groups of students are at the same level of athletic training skills going into their program, but the graduate students have already had four years of education completed. Does this experience make a difference in how they absorb and apply athletic training principles? By better understanding Kolb's experiential learning method and specific learning styles, educators will be better prepared to teach their students and shape them into competent, professional athletic trainers.

Kolb's Experiential Learning Theory

Kolb's Experiential Learning Theory and the later-discussed Learning Cycle can be traced back to the works of John Dewey, Kurt Lewin, and Jean Piaget. John Dewey, a pragmatist, believed that experiential learning was a bridge between the academic and practical worlds (Schellhase, 2006). This thought makes sense in the athletic training realm because you apply what you learn in the classroom to the real world in order to gain experience. If something such as a special test for an injury does not work, then the experience shows the person he/she should not use it again. Dewey's Model of Learning (Kolb, 1984) was composed of impulse,

observation, knowledge, and judgment. There is no specific order in which the individual uses these components, but he/she will continue the cycle until all the information is learned. These ideas are one of the frameworks of Kolb's experiential learning cycle. In learning, one can start at any of these steps. There is an observation made, knowledge about the observation is gathered, judgment is passed on what the person should do with the information, and impulse based on that judgment is carried out.

Kurt Lewin was a psychologist who studied group dynamics and leadership styles. He believed that people challenged themselves and others in order to learn further. In order to challenge themselves, they also need to challenge current thoughts and theories. Students would go through the education system blindly believing all that the professors told them, and never learn how to critically think or analyze the material for its validity. Lewin's model of learning was titled Model of Action and was composed of four stages: concrete experience, observations and reflections, formation of abstract concepts and generalizations, and testing implications of concepts in new settings (Schellhase, 2006). Simply put, people have experiences, make observations of what happened and reflect on the process/outcome, form their own concepts about the experience, and then test these concepts out in new situations or settings. Kolb's experiential learning theory is similar as he incorporated aspects of Lewin's model into his theory.

Jean Piaget (Schellhase, 2006; Kolb, 1984) believed that people's interactions with their environment determined their learning. Piaget worked more with children's developmental stages than with adults, but the ideas are similar. His model was a linear one and focused on the stages of learning based on age. There are four stages in his developmental model: sensorimotor

(concrete/enactive), preoperational (representation/iconic), concrete operational (abstract/symbolic), and formal operations (hypothetical reasoning capabilities).

Kolb's Experiential Learning theory combines bits of each of these theories into his own. The idea of experiential learning is that an individual learns from life experience by going through the learning cycle and adapting to different situations. Kolb's experiential learning cycle consists of four steps that follow somewhat of a sequential order. First, there is a concrete experience followed by second, an observation and reflection, third, by forming abstract concepts and, lastly, testing in new situations (Smith, 2001). It is possible for the cycle to begin at any one of the four points, but usually follows the pattern previously discussed. The four learning styles that Kolb developed work to separate out which steps of the cycle different learners excel at (Smith, 2001). Figure 2 shows Kolb's experiential learning cycle.

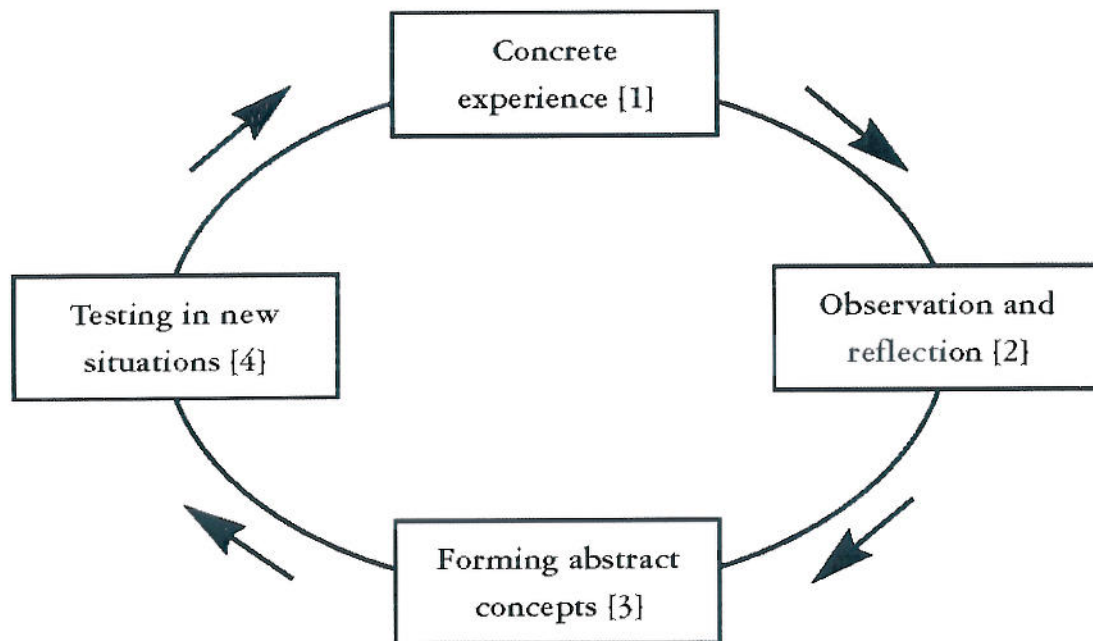


Figure 2. Kolb's Experiential Learning Cycle

Development of Learning Styles

Kolb believed that learning styles develop from interactions between an individual's internal characteristics and his/her external environment. His/her personality and how he/she acts in certain situations plays a key role in how he/she learns. For example, if the person is shy, he/she would tend to observe rather than participate. Kolb also thought there were two components to learning: acquiring an experience and transforming it into knowledge (Schellhase, 2006; Kolb, 1984).

Kolb describes his three-stage learning style development similar to Piaget's stages of development. Kolb's first stage of acquisition encompasses Piaget's sensorimotor, preoperational, operational, and formal operational stages (Schellhase, 2006; Kolb, 1984). The acquisition stage is divided into four developmental sub-stages. Each of these sub-stages is defined by how the knowledge is acquired and how it is transformed. The first sub-stage is accommodative learning. This stage is very similar to Piaget's sensorimotor stage, in which learning occurs through an active mechanism, such as feeling, touching and handling. Information is acquired by apprehension, which is a concrete mechanism, and transformed by extension or an active means (Schellhase, 2006; Kolb, 1984). Learning is based on an action; for example, to learn what a hole is, the act of digging is necessary to make the connection between the two. Once the connection is made between the action and the object, the information is able to be stored. Towards the end of this stage goal-oriented behavior starts to emerge (Kolb, 1984). Goal oriented behavior occurs when the focus is on the reward or final product instead of the process of getting there. The second sub-stage is divergent learning. This stage corresponds to Piaget's preoperational phase, and is learned through iconic mechanisms, which means that knowledge is acquired through apprehension (concrete mechanism) and transformed by intention

(reflection) (Schellhase, 2006; Kolb, 1984). During this stage the person starts to internalize the actions and converts them to images. By storing these images the immediate experience is not needed to learn. The images can now start to be recalled to make the connection (Schellhase, 2006; Kolb, 1984). The third sub-stage corresponds to Piaget's concrete operational stage. This stage is where learning occurs through symbolic mechanisms. Kolb has titled this assimilative learning since it is acquired through comprehension (abstract mechanism) and transformed by intention (reflective mechanism). Theories and concepts are relied on during this stage to make connections (Schellhase, 2006; Kolb, 1984). The final sub-stage is called convergent learning and corresponds to Piaget's formal operations stage (Schellhase, 2006; Kolb, 1984). By this point, the learner has started to use hypothetical reasoning. Knowledge is acquired by comprehension (abstract mechanisms) and transformed by extension (active means) (Schellhase, 2006; Kolb, 1984). The person develops the possible outcomes of his/her theory and then will experimentally test which ones are true (Kolb, 1984).

Kolb's second stage, which associates with things like formal education, career training, and career experiences, is called specialization. Because the direction people take in their lives depends on their inner personality and outer environment, people will shape their lives differently. Individuals are selected for jobs or education programs based on his/her strengths; and consequently feel more comfortable in those jobs. The environment they are in either forces them to change or reinforce their personal characteristics. Kolb believes a person's identity develops through their experiences, which are a result of both his/her education and his/her career choice (Schellhase, 2006; Kolb, 1984).

Kolb's third stage, integration, is associated with advancing age and starts in middle age. During this stage, personal experiences and society conflict with the person's ability to fulfill

his/her personal needs. These individuals want to be “too self-actualized” and influence others. Some reach this point through a crisis in their life, while others reach it gradually and some may even not enter this stage at all (Schellhase, 2006; Kolb, 1984). The integration stage will not be discussed in this study due to the age and nature of the subjects involved.

Classification of Learners

Kolb classifies learners in two dimensions; concrete-abstract and active-reflective. “He believes that just experiencing something is not enough; one must use the experience to create the knowledge” (Schellhase, 2006 p. 19).

The concrete-abstract dimension describes the act of taking hold of an experience, or prehension, which is either comprehension or apprehension (Schellhase, 2006; Kolb, 1984). The learner can either prefer to use comprehension, which is an abstract conceptualization of the experience, or apprehension, which is a concrete experience. A person who likes to use comprehension will most likely favor *thinking* when faced with a learning experience, whereas someone who chooses apprehension will favor *feeling* (Schellhase, 2006). An example is whether the athletic trainer is empathetic or sympathetic when dealing with an injured athlete. The empathetic person will use comprehension because they have had that injury or know what it feels like to the injured athlete. The sympathetic person is apprehensive because they do not necessarily know what the athlete is going through so they are more reserved when dealing with the injury.

The active-reflective dimension describes more of the transformation of the experience, or making a meaning out of it. People using the active-reflective dimension can either use extension (active experimentation), or *doing*, when it comes to a learning experience, or they can use intention (reflective observation) and will favor *watching* in a learning situation. An

example of *doing* something would be a student physically conducting an evaluation versus someone *watching* a physician do the same evaluation. In order to measure the amounts of these styles a person favors, Kolb designed a Learning Style Inventory (LSI) based on his experiential theory. The LSI is a nine-question survey that asks the individual to rank four words in a way that best describes his/her style of learning (Kolb, 1984). In each question each word corresponds to one of the four learning modes described below. For example, *Feeling* relates to Concrete Experience (CE), *Watching* to Reflective Observation (RO), *Thinking* to Abstract Conceptualization (AC), and *Doing* to Active Experimentation (AE). The LSI measures the person's preference towards one of the four modes, but then also takes two combination scores to see if a person relates more towards abstractness vs. concreteness (the combination of the Abstract Conceptualization (AC) and Concrete Experience (CE) scores) and action over reflection (the combination of Active Experimentation (AE) and Reflective Observation (RO) scores) (Kolb, 1984). The four basic modes are described as follows:

- 1) Concrete Experience: A high score in this category represents a “receptive, experience-based approach to learning that relies heavily on feeling-based judgments” (Kolb, 1984 p. 68; Kolb, 1985). People with a high score in this area tend to be empathetic and people-oriented. They tend to have an “artistic approach as opposed to a systematic, scientific based approach to problems” (Kolb, 1984 p. 68). These individuals are intuitive decision makers, function well in unstructured situations, and also have an all-around open-minded approach to life (Kolb, 1984).
- 2) Reflective Observation: To be strong in reflective observation means that an individual tends to focus on understanding the meaning of ideas by carefully observing (Kolb, 1984). He/she tends to have a “tentative, impartial and reflective approach to learning” (Kolb, 1984 p. 69). These people are good at looking at things from a different perspective and at appreciating

different points of view. They like to rely on their own thoughts and feelings to form opinions (Kolb, 1984).

3) Abstract Conceptualization: These individuals “focus on using logic, ideas, and concepts” (Kolb, 1984 p. 69). “They tend to be analytical, and take a conceptual approach to learning that is based in logical thinking and rational events” (Kolb, 1984 p. 69). These people are good at systematic planning, manipulation of abstract symbols, and quantitative analysis. They learn best by authority-directed, impersonal learning situations, like lectures, and they tend to need structure (Kolb, 1985).

4) Active Experimentation: “Indicates an active *doing* orientation to learning that relies heavily on experimentation” (Kolb, 1985). These individuals are good at getting things accomplished. They are risk takers and like to see the results of their work (Kolb, 1984; Kolb, 1985). Figure 3 offers a synopsis of these learning modes.

Concrete Experience (CE)	<p>Learning by feeling</p> <ul style="list-style-type: none"> • Learning from specific experiences • Relating to People • Being sensitive to feelings and people
Reflective Observation (RO)	<p>Learning by watching and listening</p> <ul style="list-style-type: none"> • Carefully observing before making judgments • Viewing issues from different perspectives • Looking for the meaning of things
Abstract Conceptualization (AC)	<p>Learning by thinking</p> <ul style="list-style-type: none"> • Logically analyzing • Systematic planning • Acting on an intellectual understanding
Active Experimentation (AE)	<p>Learning by doing</p> <ul style="list-style-type: none"> • Ability to get things done • Risk taking • Influencing people and events through action

Figure 3. Kolb’s Model of Learning Styles. Adapted from Kolb (1985)

By ranking the questions of the Learning Style Inventory one through four with four being the most true to the learning style and one being the least, the scores are obtained and the learners are placed on a quadrant of the Experiential Learning Model.

Divergers are grouped in the upper right quadrant of the model (Schellhase, 2006 and Kolb, 1985). Divergers score highest in Concrete Experience and Reflective Observation (CE and RO). These people are imaginative, creative, and in touch with their feelings. They excel viewing situations from many perspectives and generating many ideas in “brainstorming” session (Kolb, 1985). Jobs like counselors, organizational development specialists, and personal managers tend to be good fits for these individuals (Kolb, 1985).

In the lower right quadrant are Assimilators. They combine Abstract Conceptualization (AC) and Reflective Observation (RO). Assimilators do well with theories and abstract concepts. These individuals are good at synthesizing various ideas and observations into an integrated whole. They tend toward jobs in the basic sciences, mathematics, research and planning (Kolb, 1985).

Learners who fall in the lower left quadrant are Convergers. Convergers are a combination of Abstract Conceptualization (AC) and Active Experimentation (AE) (Kolb, 1985). Convergers are very good in the practical application of ideas. They seem to do best when there is a single answer or when they can focus on specific problems or situations. Convergers tend to specialize in physical sciences, engineering, and computer sciences (Schellhase, 2006; Kolb, 1985).

Being in the in the upper left quadrant classifies learners as Accommodators. These are the action people who score highest in Concrete Experience (CE) and Active Experimentation (AE) (Kolb, 1985). They are risk takers; they enjoy hands-on activities, making plans, and solving

problems by trial and error. Even with their active nature, instead of being self-sufficient, they would rather rely on others for information instead of depending on their own personal analysis. These people are found in jobs such as nursing, teaching, marketing, and sales (Schellhase, 2006; Kolb, 1985). Table 1 illustrates Learning Styles and Modes of Kolb's model.

Table 1.
Learning Styles and Modes

	Converger	Diverger	Assimilator	Accommodator
Concrete Experience (CE)		X		X
Reflective Observation (RO)		X	X	
Abstract Conceptualization (AC)	X		X	
Active Experimentation (AE)	X			X

It should be noted that none of these learning styles are fixed. They can be influenced by other factors, such as personality type, educational specialization, professional career choice, current job role, and current task (Schellhase, 2006). For example, in athletic training if a problem is presented to a student in the classroom, the individual may not look at it the same way, or handle it in the same manner if he/she were on the field. A classroom setting allows for more time to think and process versus being out on the field and having to make a split-second decision without much time to debate details. Again, if educators would keep learning style differences in mind as they design classroom instructional activities, the similarities may be more learner and setting appropriate. Learning styles are not only restricted to the classroom setting, but are utilized in other areas of a person's life such as their career choice or job setting. Learning Styles and the activities or skills needed for certain jobs can make a difference on whether an individual is successful in that setting or not.

There is a special term for the influence of education specialization, professional career choice and current job role “environmental press” (Stutsky & Laschinger, 1995 p. 143). Kolb calls this “accentuation” (Schellhase, 2006 p. 20). Accentuation means that career choice of an individual is guided by his/her learning style. He/she chooses a career that matches how he/she learns and processes the best; otherwise they will not be a good fit for the job and ultimately become unhappy.

Another element that determines success in a job is environmental stress from co-workers and/or a superior. For example, a study done in the nursing program showed that since most of the classes were active learning classes, the students expanded their skills as Accommodators (Lisko & O’Dell, 2010). If student are put into a situation where their superior has a certain way of doing things, they may need to adapt their own learning style in order to accomplish the tasks set forth by the superior. So if given the choice, people will gravitate towards jobs and others that tend complement their own learning style. The individuals that are put into jobs or situations that best match their learning styles; have the best chance of improving and being successful (Schellhase, 2006).

Learning Styles in Athletic Training and Other Allied Health Professions

There has been some interest in researching preferred learning styles of undergraduate athletic training students (Harrelson, Leaver-Dunn & Wright, 1998; Stradley et al, 2002, & Draper, 1989) but no studies have investigated graduate students and preferred learning style.

Harrelson, Leaver-Dunn, & Wright (1998) used Kolb’s Learning Style Inventory to “assess the learning styles of CAAHEP-accredited undergraduate athletic training education program students” (p. 50) and even more specifically the “differences between the sexes” (Harrelson, Leaver-Dunn & Wright, 1998 p. 50). This study was published while CAAHEP was still the

accrediting agency before CAATE was established. The results of this study showed that there was “no clear preference of a learning style for either sex” (p. 52).

In the study done by Draper (1989) learning style preferences of undergraduate athletic training students were assessed to see if the “NATA Certification test was biased towards any particular style” (Draper, 1989 p. 234). Although this study did not use the specific Kolb LSI, a similar type of survey was used. By surveying students after they had taken the exam and comparing their scores on the survey to those of the exam, Draper was able to observe that there was “no relationship between the exam scores and the personal learning styles of the student” (Draper, 1989 p. 234). These results revealed the Certification test for athletic training students is not biased towards any specific learning style so all those tested have an equal opportunity to do well on the exam.

Stradley et al. (2002) “identified the learning styles and preferred environmental characteristics of undergraduate athletic training students in Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredited athletic training education programs” (p. 142). Using Kolb’s LSI, Stradley did not find significant differences in the preferred learning styles of the students or in the environments they preferred to learn in. The results of this study in combination with Harrelson et al. (1998) seem to suggest that even though the environment in which the material is learned changes, the students’ learning styles will adapt to fit the environment as previously stated by Kolb (1984). Even though it isn’t ideal, most students are able to learn regardless if the instructor uses the students’ preferred method of teaching. Although a student has a preferred learning style, he/she will continue to acquire and process new information presented in various teaching methods (Kolb, 1984).

A case study done with a nursing curriculum based on different aspects of the Kolb learning cycle (Lisko & O'Dell, 2010) supported the thought that learning is a continuous process and can change the way a person thinks (Kolb, 1984). The responses from the students and faculty were that the integration was beneficial. The students decided that the scenario-based laboratory practice and simulations were the most beneficial (Lisko & O'Dell, 2010). These kinds of activities are most beneficial for concrete learners. In another nursing case study done by Stutsky & Laschinger (1995), senior nursing students were involved in a preceptorship experience in order to see the effect it had on their learning style. A preceptorship experience is the student working one-on-one with a preceptor or mentor for three months. The results in this study indicated that a current job role will help shape the learning style (Kolb, 1984). The preceptorship experience helped the students adapt better to the changes throughout the program. Agreeing with Kolb, this study showed that no one is strictly oriented to one learning style. Also, the results supported the fact that nursing students are both "people-oriented and scientific" (Stutsky & Laschinger, 1995).

Closely related to nursing in the Allied Health Profession are doctors and pharmacists. Robinson (2002) did a study on general practitioners to see if their learning style had an effect on their continuing education choices. By understanding the majority of learning styles the NATA and other affiliates can better determine what continuing education opportunities to offer. Learning continues past college, and continuing education is what keeps health professionals up-to-date on new information.

Summary

Athletic training students learn in both didactic and clinical experiences during their education on their way to become an athletic trainer. During this time they focus on the twelve

domains of clinical practice. In order to teach them effectively and offer the student opportunities to learn, educators should be aware of the different learning styles. David Kolb has developed the Experiential Learning Theory and a learning style classification that educators can use based on a combination of theories by Dewey, Lewin and Piaget. According to Kolb, learning from life experience and the learning cycle, make up his Experiential Learning Theory (Schellhase, 2006; Kolb, 1984). The learning cycle theorizes that a concrete experience is had, observations and experiences are made, abstract concepts are formed, and they are tested in new situations (Smith, 2001). The learning styles are developed from interactions between personal characteristics and external environmental influence (Stutsky & Laschinger, 1995; Schellhase, 2006; Kolb, 1984). In order to learn, according to Kolb there are two components: acquiring an experience and transforming it into knowledge. The acquisition of knowledge is divided into four sub-stages; accommodative learning, divergent learning, concrete operational and convergent learning. Next comes the specialization phase, where information is learned through formal education and career training, then finally the integration, which is not discussed at this time. Kolb designed the Learning Style Inventory (LSI) to measure the style a person favors. It measures a preference of one of the four modes (Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation) and a combination score to find which dimension they prefer (abstract vs. concrete or action vs. reflection). Based on his/her LSI score, the learner is placed onto a quadrant to see how specific they are to each of the four modes. No styles are fixed, there is certainly a preference but the learner can adapt to accommodate to other situations.

In order to test these learning styles, Marshall and Merritt (1986) designed and tested an instrument they titled the Learning Style Questionnaire to test individual learning styles with an

experiential learning model (Marshall & Merritt, 1986). The questionnaire is a 40-question survey determining preferred learning styles based on the Kolb Experiential Learning Theory (Marshall & Merritt, 1986). A previous model designed by Kolb in 1978 has demonstrated considerable face validity but had some problems such as the use of a paired comparison, and lower scale reliabilities (Marshall & Merritt, 1986; Kolb, 1978). During a study to test the reliability and validity the Learning Style Questionnaire was administered to 543 students at two different universities. The students represented a variety of majors and points in their years of education (Marshall & Merritt, 1986). The results of this study suggested that the Learning Style Questionnaire is reliable and has construct validity. Three of the four scales demonstrated sufficiently high reliability for individual interpretation, and seemed to support Kolb's theory that most individuals have a predominant learning style that they prefer and it can be identified by using Kolb's Experiential Learning Model (Marshall & Merritt, 1986).

In October of 1991, the Joint Review Committee of Education Programs in Athletic Training (JRC-AT) was formed under the Commission on Accreditation of Allied Health Education Program (CAAHEP) and was in charge of accrediting entry level athletic training programs (CAATE, 2010). Then on June 30, 2006 the JRC-AT became independent from CAAHEP and changed its name to Commission on Accreditation of Athletic Training Education (CAATE) and continues on with the accreditation of 360 entry level athletic training programs (CAATE, 2010).

To date, there have been no learning style studies done on graduate entry level athletic training students. Some studies on learning styles have been done on different professions, but whether or not these are similar to entry level athletic training students is yet to be seen. This

study will take a closer look at the relationship between both undergraduate and graduate level athletic training students and their own learning style differences.

CHAPTER 3. METHODS

In order to improve the education of undergraduate and graduate athletic training students it would be beneficial to know if there are any differences or similarities in their learning styles. Using the Learning Style Questionnaire by Marshall and Merrit (1986) an idea of the preferred learning style of undergraduate and graduate athletic training students can be assessed as well as if there are significant differences in the learning styles of undergraduate students versus graduate students, and differences in learning styles between males and females of both undergraduate and graduate students.

Population Sample and Sampling Procedures

The sample for this study consisted of 69 students from 21 entry level graduate programs and 429 students from 88 entry level undergraduate programs. Students ranged in age from 18-30+. Demographic data included: student education level (undergraduate/graduate), gender, age (mean and SD), number of courses completed, number of semesters of classroom experiences completed, and number of clinical experience sites. Additionally, graduate students indicated their undergraduate degree (BS, BA), and major (Exercise Science, Physical Education, Biology, Other, etc.). Considering Kolb's experiential learning theory, the demographic questions were used to help derive a student's previous experiences and what impact those experiences may have on their learning style. As an incentive to increase participation in the study, a drawing for two \$25 Best Buy gift cards was offered to the students, and the Program Director received results on his/her students' preferred learning styles if there were 10 or more students who answered the question.

Survey/Questionnaire

North Dakota State University Institutional Review Board (IRB) approval was gained on October 12, 2011 (Appendix 1). Mr. Marshall gave his consent via email to use his survey (Marshall and Merrit, 1986) on May 7, 2011 (Appendix 2). The original survey is a 40-question Student Learning Style Questionnaire (Appendix 3) that asks the student to determine which of two words given on each side of the screen is more characteristic of his/her learning style (Marshall and Merrit, 1986). The choices are a continuum of five choices labeled: “A”-Generally (Most of the Time), “B”-Over Half the Time, “C”-About Half the Time, “D”-Over half the time, and “E”-Generally (most of the time). “A” is closest to the word on the left, and “E” is closest to the word on the right. The students are also instructed to choose “C” if they cannot choose between the two words (Marshall and Merrit, 1986). For the survey distributed for this study, this survey was made electronic by the Group Decision Center on the North Dakota State University campus. Instead of “A-E,” the numbers 1-5 were used for the continuum due to the set up of the program used to produce and email the survey (Appendix 7).

The survey contains four learning style dimensions which determine how a person processes information. These dimensions are based on the responses given by the participant for each question. The learning style dimensions include: Concrete experience (CE), Abstract Conceptualization (AC), Reflective Observation (RO), and Active Experimentation (AE). Each question corresponds to one of the four modes and each set of scores is added. The Concrete Experience (CE) set is attached to the questions numbered: 1, 4, 5, 12, 14, 18, 21, 25, 28 and 30. The Reflective Observation (RO) group was taken from question numbers 2, 3, 8, 9, 20, 22, 31, 33, 35 and 37. The Abstract Conceptualization (AC) group was derived from questions numbered 10, 15, 17, 24, 26, 27, 29, 34, 36 and 38. And finally, the Active Experimentation

(AE) set is taken from questions 6, 7, 11, 13, 16, 19, 23, 32, 39 and 40. The means for each learning style dimension are calculated by adding all the scores on the 40 questions.

Once these groups were determined, the Abstract Conceptualization (AC) score was subtracted from the Concrete Experience (CE) score to determine the ACCE score for the individual. ACCE is known as the information perceiving score. Then the Active Experimentation (AE) score was subtracted from the Reflective Observation (RO) score to determine the AERO score. The AERO score determines the information processing method for the individual. The ACCE and AERO scores are then plotted on the quadrants (Appendix 6) to determine the predominant learning style of Diverger, Assimilator, Converger or Accommodator. If the score happens to fall on either the ACCE or AERO line between 2 styles, the individual is considered a combination of both.

Procedures

An email (See Appendix 4) was sent to the college or university's Athletic Training Education Program Directors asking them if they were willing to forward the survey to their students. If the Program Director was willing, another email (See Appendix 5) was sent with a link to the survey inviting the students' participation in this study. This email served as an informed consent for the students. After the informed consent page, the survey started off with the demographic questions page and then the survey questions followed. The survey was made electronic through the North Dakota State University Group Decision Center and emailed to the students by their Program Director. The survey remained open for three weeks for the students to respond. A reminder email (Appendix 6) was sent to the Program Director to forward to students after the first week, and one week later to remind them of the closing date. However, following the initial email that was sent to the Program Director, the reminder email timing was

not set correctly. The first and final reminders were sent together instead of going out within a week of each other due to a technical problem in the program.

Analysis

SAS (Version 9.2) was used for analysis. Descriptive statistics, such as percentages, means and standard deviations was calculated for the demographics. A two way ANOVA test was also run on the demographic data. In order to calculate a more accurate mean for the age groups, the exact age of the participants that selected 30+ as an age group was not known, therefore the 30+ age group data were deleted out of the mean and standard deviation calculation. Chi-square goodness of fit and chi-square of independence tests were used to compare differences in learning style and differences between groups. An alpha of $\leq .05$ was chosen *a priori* to indicate significance.

CHAPTER 4. RESULTS

The purpose of this study was to improve the education of athletic training students by recognizing differences in their learning styles. Using Marshall and Merrit's Student Learning Style Questionnaire (1986) based on Kolb's learning style theory; an idea of differences or similarities between these two groups of students may provide educators insight needed to improve teaching methodology.

The results of the statistical analysis answered the following questions:

1. What was the preferred learning style of undergraduate entry level athletic training students?
2. What was the preferred learning style of graduate entry level athletic training students?
3. Was there a significant difference in the preferred learning styles of undergraduate entry level athletic training students versus graduate entry level athletic training students?
4. Was there a significant difference in preferred learning styles between male and female undergraduate entry level athletic training students?
5. Was there a significant difference in preferred learning styles between male and female graduate entry level athletic training students?

Representatives from 88 out of 330 undergraduate programs participated in the study. See Appendices 9 and 10 for the list of undergraduate and graduate institutions. Five hundred thirty-five undergraduates started the survey; however, only 429 completed it. If the survey was started, but one or more questions were left blank then the survey was considered invalid. One hundred twenty-five of the undergraduate respondents were male and 303 were female. One person did not indicate a gender. Representatives from 21 out of 26 graduate programs participated. Eighty-three students started the survey, but only 69 completed it. Twenty-seven of the graduate

students were male and 42 were female. The remainder of the demographic data was used to better understand what the educational background of the participants actually was. Classes taken and clinical experiences could play a role in the preferred learning style of the individual. A two-way ANOVA test was run on this demographic data; however, due to lack of significant findings the results were not reported.

Demographics of Undergraduate Students

The average age of the undergraduate students was 20.74 (SD ±1.87). The age breakdown can be seen in Table 2. There were seven individuals that selected the “30+” option for age but were left out of the table because it skewed the data. Four hundred and twenty eight students answered the gender question; 29.21% (n=125) were males and 70.79% (n=303) were females.

Table 2.
Undergraduate Students’ Age

Age	Number (N=422)	Percent
18	25	05.83
19	68	15.85
20	119	27.74
21	114	26.57
22	52	12.12
23	19	04.43
24	8	01.86
25	3	00.70
26	3	00.70
27	1	00.23
28	7	01.63
29	3	00.70

Class distribution can be seen in Figure 4. Survey respondents included: 6.38% (n=27) Freshman, 35.46% (n=150) Sophomores, 33.81% (n=143) Juniors and 24.35% (n=103) Seniors. There were six individuals who chose not to answer this question.

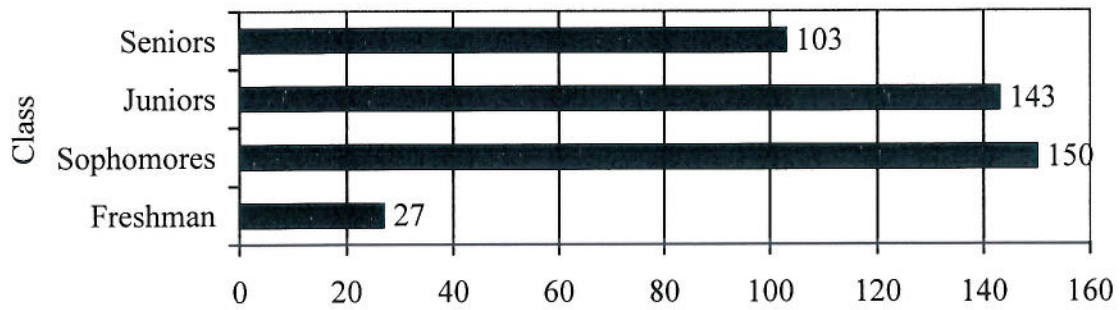


Figure 4. Undergraduate Class

Undergraduate students were also asked to indicate their undergraduate degree. Only 166 out of 429 responded to this question due to the fact that they may have been confused as to this was the degree they were currently seeking, not already gained. See Figure 5.

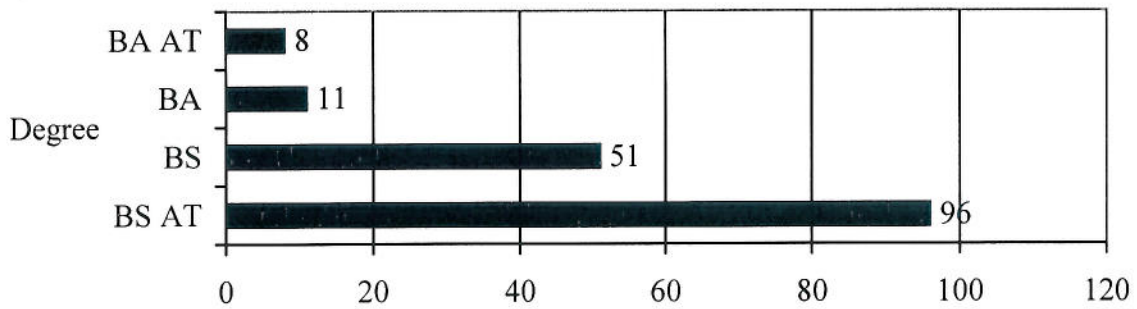


Figure 5. Undergraduate Degrees

Figure 6 shows how many semesters of didactic experience the student had completed. Approximately 28.00% (n=117) had zero to one semester of classroom experience, 38.85% (n=162) had two to three semesters, and 33.09% (n=138) had four or more semesters of classroom experience. Twelve individuals did not answer this question.

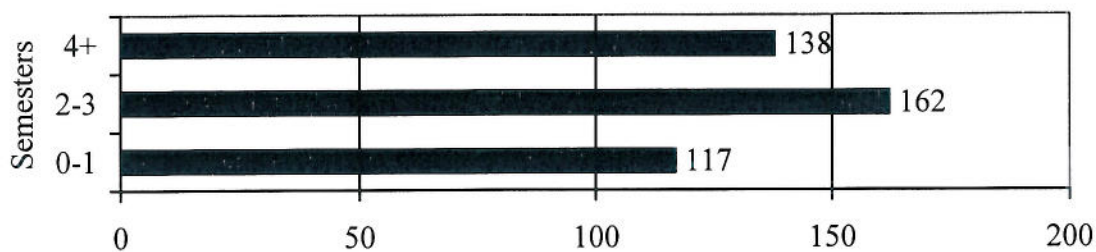


Figure 6. Undergraduate Semesters of Didactic Experience

Figure 7 shows demographic data related specifically to Athletic Training courses, and the number of courses completed. One to two courses were completed by 21.78% (n=93) of the students, 15.69% (n=67) completed three to four courses, 12.65% (n=24) completed five to six courses, 12.18% (n=52) completed seven to eight courses, 13.58% (n=58) completed nine to ten courses and 24.12% (n=103) completed 11-12 courses. Two individuals did not answer this question.

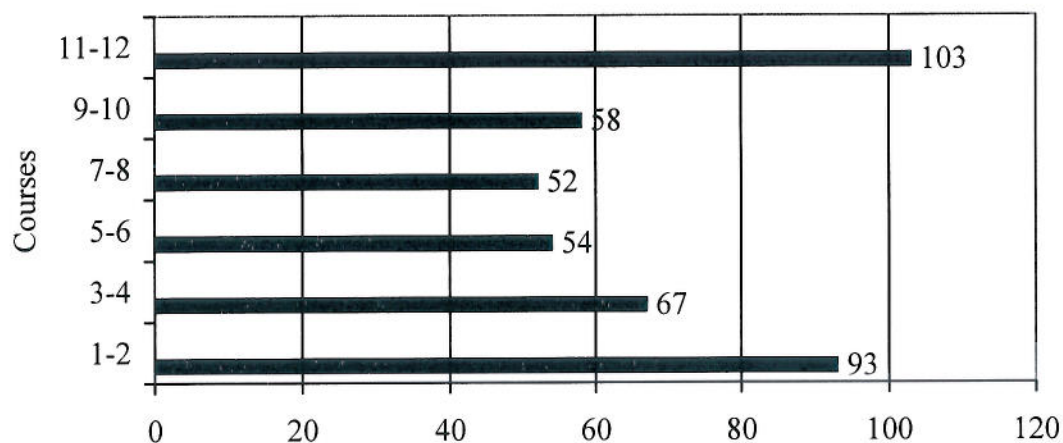


Figure 7. Undergraduate Athletic Training Courses

Students were asked to check all that applied for completed Clinical Experience sites. These included General Medical, Low Risk (golf, tennis, cross-country, indoor and outdoor track, baseball, softball and swimming), Moderate Risk (volleyball, basketball, soccer, wrestling, and gymnastics), Equipment Intensive/High Risk (football and hockey), Female Sports, Male

Sports, High School, and Other. As shown in Figure 8, 7.15% (n=139) of students have done a General Medical experience, 13.61% (n=253) have done a Low Risk experience, 17.59% (n=327) completed a Moderate Risk experience, 15.33% (n=285) have done an Equipment Intensive/High Risk experience, 15.98% (n=297) have done a Female Sport, 17.48% (n=325) have done a Male Sport, 11.19% (n=208) have been to a High School, and 1.67% (n=31) of students checked “Other”. Physical Therapy clinics, observing surgeries and other different sports made up this category.

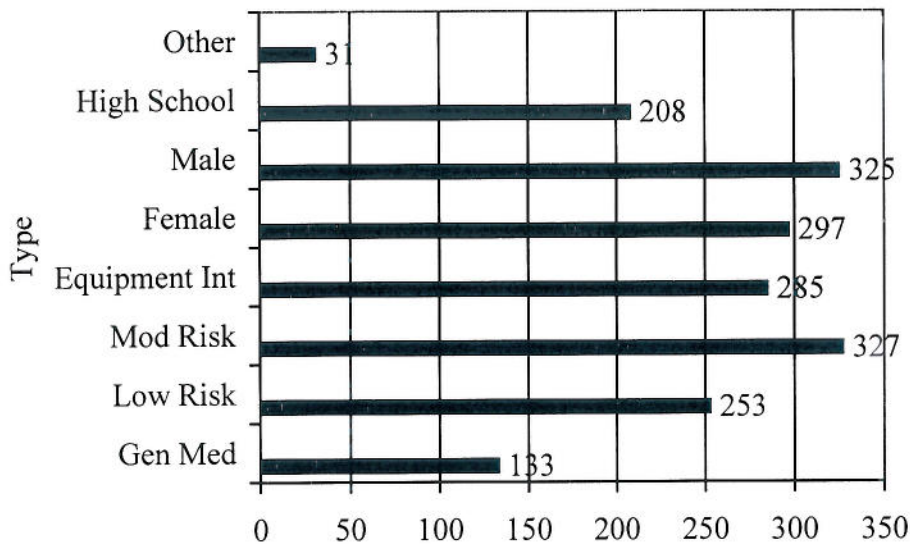


Figure 8. Undergraduate Clinical Experiences

Demographics of Graduate Students

The graduate students were asked the same demographic questions with only a few variances. There were 83 students that initially started the survey, but only 69 completed it. Of these 69, 39.13% (n=27) were male and 60.87% (n=42) were female. The average age of graduate students was 23.70 (SD ± 1.78) and the age range is shown below in Table 3. There were four individuals that selected the “30+” option for age, however, they were left out of the table because it skewed the data.

Table 3.
Graduate Students' Age

Age	Number (N=65)	Percent
20	1	01.45
21	1	01.45
22	15	21.74
23	17	24.64
24	17	24.64
25	5	07.25
26	4	05.80
27	2	02.90
28	2	02.90
29	1	01.45

Graduate students were asked their current year in their program. Approximately 55% (n=36) were in their first year and 44.62% (n=29) were in their second year. Four students did not answer this question. The graduate students' current degree is listed in Figure 9. There were 48.15% (n=26) pursuing a Master of Science (MS) degree, 44.44% (n=24) a Masters of Athletic Training (MAT) degree, 5.56% (n=3) a Masters of Arts (MA) degree, and 1.85% (n=1) was pursuing something other than these options. Fifteen individuals did not answer this question.

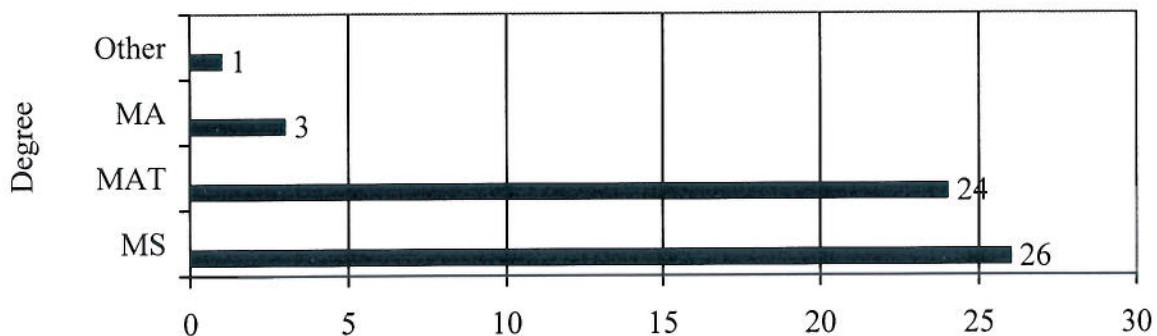


Figure 9. Graduate Degrees

Table 4 shows that 27.27% (n=18) were Athletic Training majors, 36.36% (n=24) were Exercise Science majors, 6.06% (n=4) were Kinesiology majors, 6.06% (n=4) were Physical Education majors, 4.55% (n=3) were Biology majors, 3.03% (n=2) were Nutrition majors, 3.03%

(n=2) were Human Performance majors, and the remainder degrees with 1.52% (n=1) each were Sociology and Kinesiology, Health Ecology, Biochemistry, Health Administration, Sports Medicine, Criminal Justice, Psychology, Applied Exercise Physiology, and Biomedical Humanities. There were three individuals who did not answer this demographic question.

Table 4.
Graduate Students' Undergraduate Major

Major	Number (N=66)	Percent
Athletic Training	18	27.27
Exercise Science	24	36.36
Kinesiology	4	6.06
Sociology and Kinesiology	1	1.52
Nutrition	2	3.03
Health Ecology	1	1.52
Human Performance	2	3.03
Biochemistry	1	1.52
Biology	3	4.55
Health Administration	1	1.52
Sports Medicine	1	1.52
Physical Education	4	6.06
Criminal Justice	1	1.52
Psychology	1	1.52
Exercise Physiology	1	1.52
Biomedical Humanities	1	1.52

Athletic Training courses completed are shown in Figure 10. Of the graduate students, 20.29% (n=14) have had one to two courses, 20.29% (n=14) have had three to four courses, 4.35% (n=3) have had five to six courses, 7.27% (n=5) have had seven to eight courses, 18.84% (n=13) have had nine to ten courses, and 28.99% (n=20) have completed 11-12 Athletic Training courses.

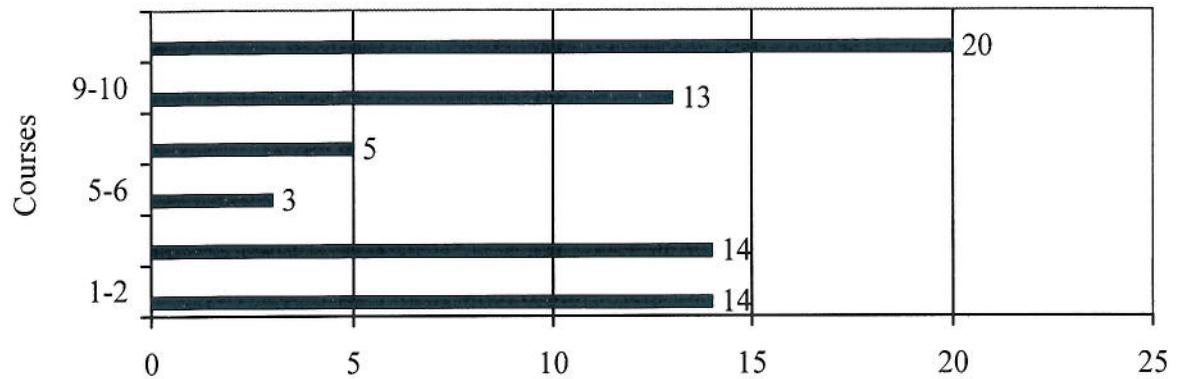


Figure 10. Graduate Athletic Training Courses Completed

Figure 11 shows the Clinical Experiences completed by the Graduate entry level athletic training students. General Medical rotation experience were completed by 9.20% (n=32) of the students, 11.49% (n=40) completed a Low Risk experience, 14.94% (n=52) completed a Moderate Risk Experience, 15.23% (n=53) completed the Equipment Intensive experience, 15.23% (n=53) completed a Female Sport experience, 15.52% (n=54) completed a Male Sport experience, 15.52% (n=54) have done a High School experience, and 2.87% (n=10) have done something other than these such as working in Physical Therapy offices and observing surgeries.

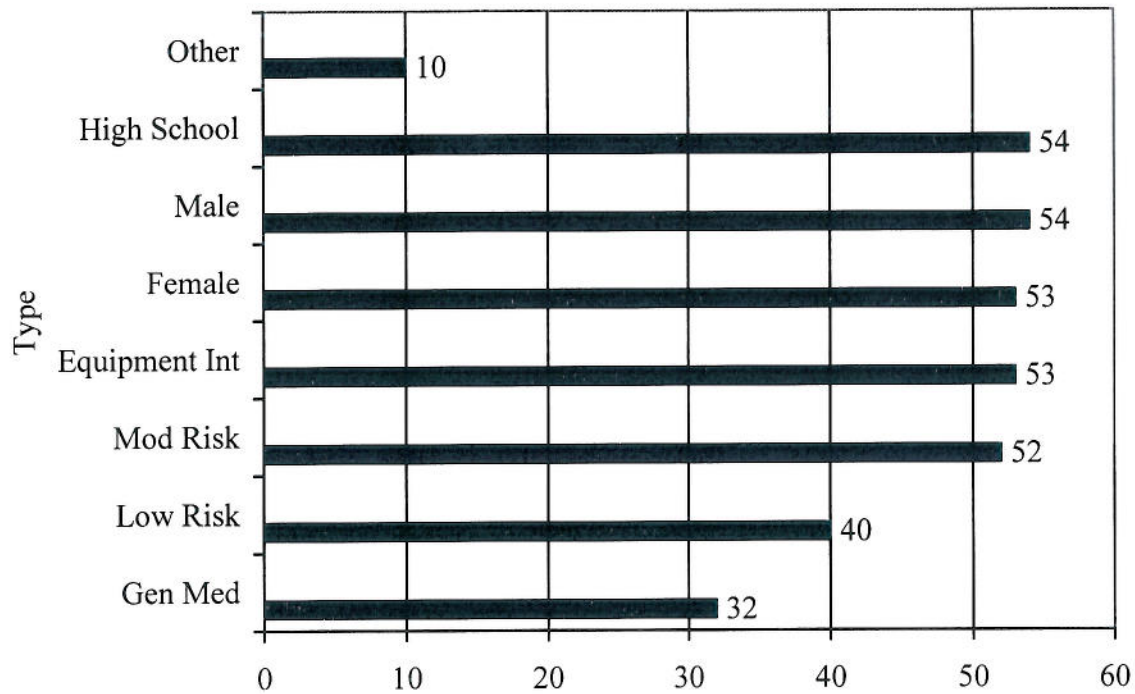


Figure 11. Graduate Clinical Experiences

Research question one asked what was the preferred learning style of undergraduate entry level athletic training students. The results showed 74.83% (n=321) of undergraduate students preferred the Diverger style of learning, Assimilator 9.79% (n=42), Accommodator 8.68% (n=37), and 2.80% (n=12) were the Converger style. Combination learning styles were as follows: 1.40% (n=6) students would be considered Accommodators/Divergers, 2.10% (n=9) were Diverger/Assimilators, 0.23% (n=1) encompassed all 4 Learning Styles and 0.23% (n=1) was considered a Converger/Assimilator. The chi-square goodness of fit test showed a p-value of <.0001 which was significant of a difference between the learning styles. Diverger was the preferred learning style of undergraduate entry level athletic training students. These results are shown in Figure 12.

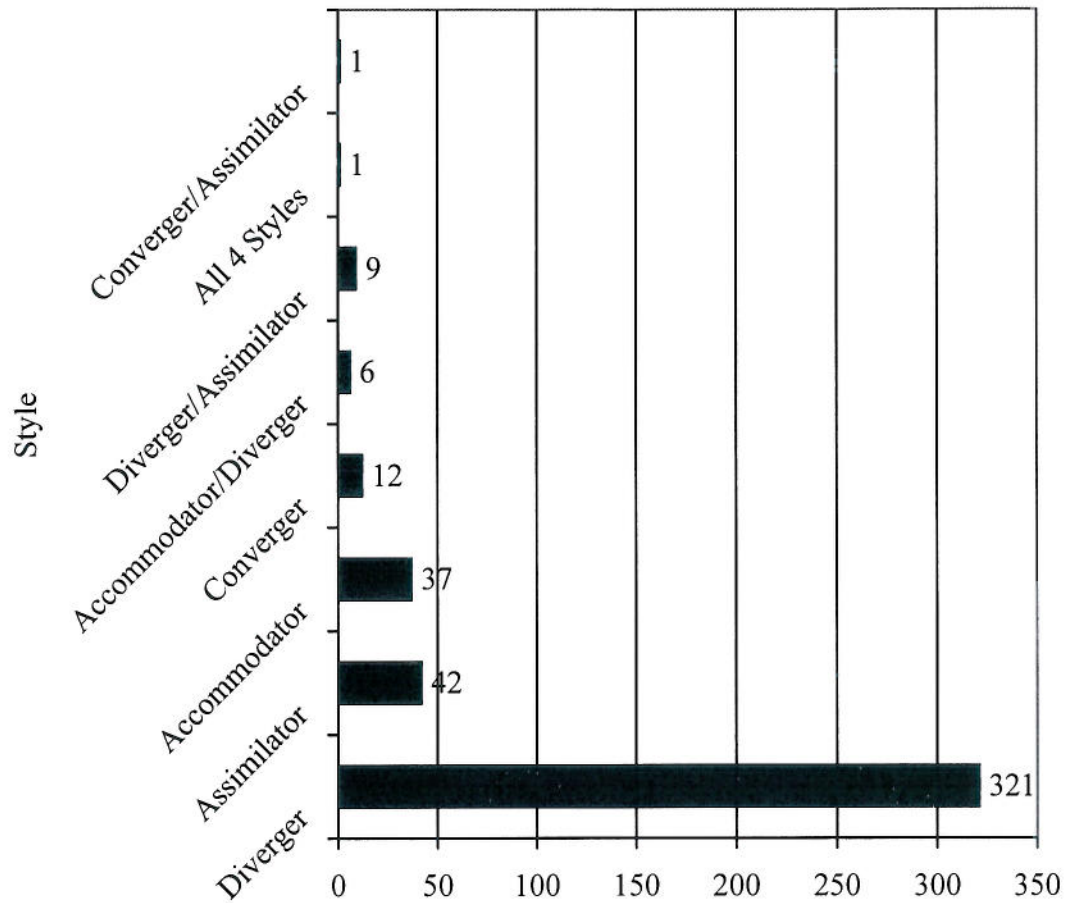


Figure 12. Undergraduate Preferred Learning Styles

Research question two asked what was the preferred learning style of graduate entry level students. The Diverger style was preferred by 68.12% (n=47) of the students, the Accommodator style was preferred by 15.94% (n=11), the Assimilator style was preferred by 7.25% (n=5) and the Converger style was preferred by 1.45% (n=1). The combination learning style preferences were as follows: the Accommodator/Diverger combination was 1.45% (n=1) of the students, 1.45% (n=1) preferred a combination of all 4 styles, and 4.35% (n=3) was a Diverger/Assimilator combination. The chi-square goodness of fit test showed a p-value of <.0001 and was significant of a difference between the learning styles. Diverger was the

preferred learning style of graduate entry level athletic training students. These data are shown in Figure 13.

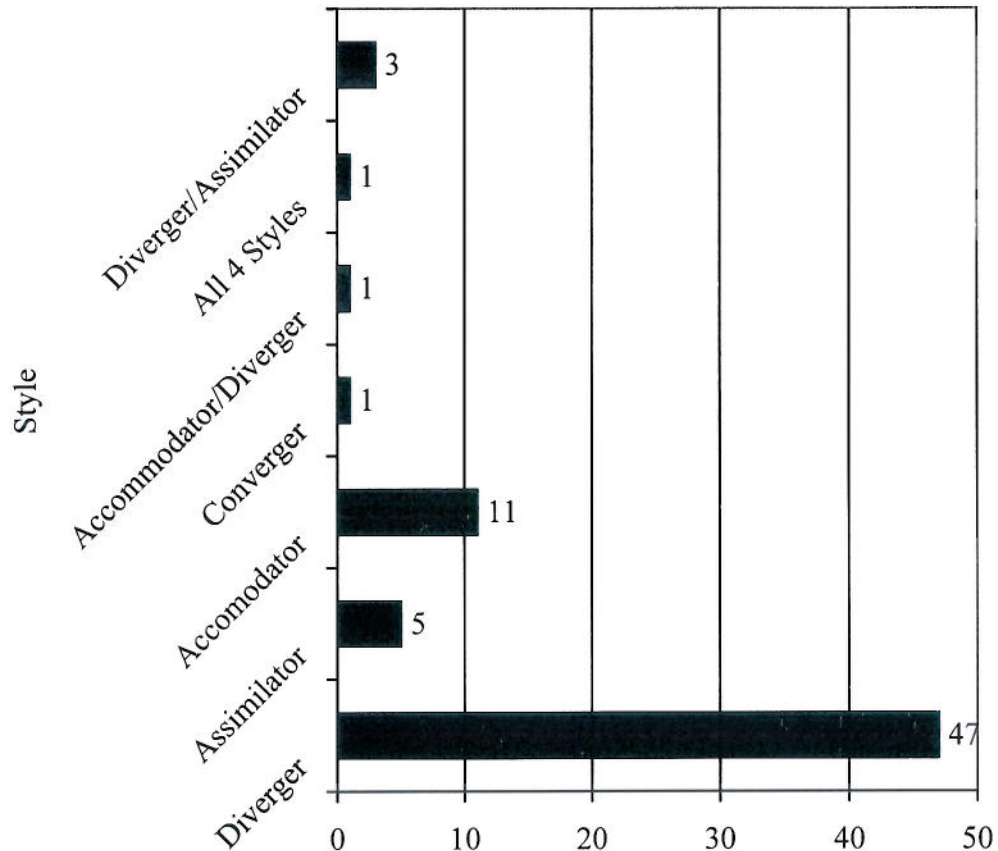


Figure 13. Graduate Preferred Learning Styles

Research question three asked if there was a significant difference between the preferred learning style of undergraduate students and graduate students. There was no significant difference found between the preferred learning styles of undergraduate students and graduate students. Chi-square of independence tests were used to determine the differences between the undergraduate and graduate students. The results of the Chi-square test indicated a p-value of 0.2095 which is greater than the alpha level of 0.05 indicating no significant difference existed in the scores of these two groups.

Research question four asked if there was a significant difference between preferred learning styles of male and female undergraduate students. Diverger was the preferred learning style of 79.20% (n=99) undergraduate male students and 77.62% (n=222) of undergraduate female students. The chi-square of independence test had a p-value of 0.1794 which is greater than the alpha level of 0.05 indicating no significant difference existed in the scores of these two groups.

Research Question five asked if there was a significant difference of preferred learning styles between male and female graduate students. The male graduate students preferred the Diverger style (72.00%; n =18) as did females (74.36%; n=29). The chi-square test of independence showed no significant differences due to the fact that the p-value of 0.1794 is greater than the alpha level of 0.05

CHAPTER 5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Discussion

The Student Learning Style Questionnaire by Marshall and Merrit (1986) was used in this study to determine the entry level graduate and undergraduate athletic training students' preferred learning styles and the differences in preferred learning styles between males and females at the graduate and undergraduate levels. Based on percentages of undergraduate students (74.38%), graduate students (68.12%) and statistical significance, the Diverger style was the most preferred. These findings differ from other research (Draper, 1989; Harrelson, Leaver-Dunn & Wright, 1998; and Stradley et al., 2002) that found the Accommodator and Assimilator learning styles were preferred by higher percentages of students and that the lowest percentage of students preferred the Diverger style. However, in these studies the percentages were fairly even so there was no statistical significance found. In this study, there was no statistical significance for differences between males and females, and undergraduate and graduate students, which is similar to what other research has shown

The undergraduate entry level athletic training students preferred the Diverger style of learning followed by Assimilator, Accommodator, and Converger. The graduate students similarly preferred the Diverger style of learning followed by Accommodator, Assimilator and Converger. The chi-square goodness of fit test was statistically significant for the preference of the Diverger style in both undergraduate and graduate students. In both the graduate and undergraduate groups the Diverger learning style was also preferred by both the males and females. These preferred learning styles results are based off a percentage, and the Chi-square test that indicated no significant difference between groups. The two modes that make up the Diverger learning style are Concrete Experience and Reflective Observation. Individuals with

high scores in the Concrete Experience mode take a “receptive, experience based approach to learning that relies heavily on feeling-based judgment” (Kolb, 1984 p. 68; Kolb, 1985). They have an artistic approach to problem solving versus a more scientific based approach (Kolb, 1984). These individuals also are intuitive decision makers that function well in unstructured situations and have a very open approach to problem solving (Kolb, 1984).

In Athletic Training, there are unstructured situations that need to be dealt with and this particular learning style can be used to the individuals’ advantage. For example, not all injuries will present in the same manner. There may be differences in the signs and symptoms or in how the athlete is dealing with the injury. The athletic training student needs to tailor his/her approach to each athlete and injury differently. Other examples of unstructured situations are: practices may run late or not follow a schedule, athletes may have a class, or game situations may not go according to plan. This becomes a time to prioritize or time-manage so that the unstructured situation can be made manageable. In addition to the Concrete Experience, the Reflective Observation mode is the second component of the Diverger learning style. This mode is true to its namesake; the individual “tends to focus on understanding the meaning of ideas by carefully observing” (Kolb, 1984 p. 69). One of the strengths of individuals scoring high in the Reflective Observation mode is that they are able to see things from a different perspective and can appreciate different points of view. Athletic training clinical experiences are set up to be a gradual progression. The students observe the Approved Clinical Instructors, and as students’ skills progress they are allowed to take a more active role in the setting. Activities that are utilized in the didactic setting to help integrate the clinical experiences are reflective journaling or writing papers. These activities allow students to actively reflect on what they have been observing and be given feedback. By observing other Athletic Trainers and their peers, students

are able to decipher which skills would be needed in different situations or how they should handle situations when they are allowed to apply the skills. Divergers tend to be very creative and imaginative people. Divergers have been known to have an interest in the arts or the humanities, or come from a liberal art background (Kolb, 1985).

In order to help Divergers succeed, educators should take note of how these individuals tend to take in and process information. Observation hours are beneficial to help the students solidify the skills needed for the profession. Also, brainstorming sessions are very helpful for these individuals to get all of their ideas out in the open (Kolb, 1985). Brainstorming helps to focus the large amount of content that Athletic Training covers in its 12 domains (NATA, 2010). Working with others is also another strategy that brings out the best of the Divergers since they are already empathetic and socially-oriented (Kolb, 1984). Group work or being able to observe other classmates would be beneficial didactic strategies to implement. Mentorship between the upperclassman and underclassman could be implemented. The underclassman would have the opportunity to observe the upperclassman as well as interact with them in the clinical experiences and the didactic experiences.

Previous research conducted on undergraduate entry level athletic training students indicated no statistical significance of a preferred learning style (Draper, 1989; Harrelson, Leaver-Dunn & Wright, 1998; and Stradley, 2002) which differs from the findings of this study. This study found the Diverger learning style was most preferred by 74.38% of the undergraduate students and 68.12% of the graduate students, and was statistically significant with the chi-square goodness of fit test. According to Stradley et al. (2002), the most preferred learning styles were Accommodator and Assimilator both at 29.30% of the respondents, 21.80%

preferring the Converger style and 19.70% preferring the Diverger style. Since the percentages were fairly similar, there was no statistical significant difference found.

Similarly, the graduate entry level athletic training students showed their preferred learning style to be Diverger as well. The researcher of this study could find no research that has been done on graduate entry level athletic training programs. Graduate students have more didactic experiences and general life experience than undergraduates, which may influence their preferred learning style. In brainstorming activities this life experience comes into play and because of the different experiences more new ideas will be generated. Graduate students have also had more time to reflect on things that they have seen. The possibility of coming from a liberal art background is also not uncommon with graduate students. Even though some of the undergraduates have come from a liberal art background, they may be in the earlier years of their education and have not received the exposure that the graduate students have experienced. Since a major element of the Diverger is that they acquire information through reflective observation, Athletic Training faculty should strive to include this in the didactic and clinical experience curriculum of the program.

Although the Converger and Accommodator learning styles were at a lower percentage, the researcher thought more students would have preferred these two styles. Kolb (1984) indicated that individuals who prefer the Converger learning style tend to specialize in the physical sciences and are very good at the practical application of ideas. Accommodators are individuals who excel in thinking on their feet and have been known to be in more action oriented jobs, such as nursing or sales. They enjoy more hands-on practical experience. The researcher thought that the athletic training students would fall into one of these categories more-so than the Diverger category.

Athletic Trainers are very versatile individuals; however, and can possess traits of a Diverger. They are able to make decisions quickly and are very creative when it comes to making use of their resources. They are comfortable working with people and are able to think “outside the box” when necessary. Athletic trainers are known to stay calm when there is a life-threatening issue, yet they can be great motivators when it comes to working with an athlete rehabilitating from an injury. Many are very creative, and come up with new ideas for taping procedures, exercises, or even how to tailor a rehabilitation plan to get a certain individual back to play as soon as possible. Athletic trainers work with people on a daily basis, and therefore, need to be well versed in the human emotion spectrum. Helping calm down a devastated basketball player who has just torn his/her Anterior Cruciate Ligament (ACL) or celebrating a milestone in an ankle rehabilitation program of a soccer player is all in the day’s work.

Recommendations

In order to keep up with the changing trends in education, more research is needed to determine differences between entry level undergraduate and graduate athletic training students. Future research should also focus on graduate students. To date, most research has focused on the undergraduate student due to this being the only type of entry level athletic training program at the time. The graduate entry level program is a fast growing option for students pursuing the athletic training profession. To further assess possible changes over time in preferred learning styles, a longitudinal cohort study with graduate students could be done in their undergraduate careers, and then again once they start their graduate career. Continuing the learning style research in athletic training programs will promote better communication between students and faculty and will assist in the success of the students as they grow and shape the profession.

In the case of this particular study, the following recommendations are made to future investigators. With regard to the distribution of the survey, changes could be made to ensure a higher response rate. First, the emails that were sent out had a timing glitch and were not as effective. The survey went out on the date scheduled; however, some of the first reminders and final reminders got grouped together and went out during the second week. There may have been some confusion on the closing date of the survey due to this mix up.

Second, the survey allowed the respondent to go on to the next question without recording an answer on the current question. This error impacted the response rate of completed surveys.

Conclusion

It was concluded from this study that undergraduate and graduate entry level athletic training students have a variety of learning styles, but prefer the Diverger style. The same is true with the males and females of each group. The Diverger style was the preferred learning style within both undergraduate and graduate entry level athletic training students and both males and females with no statistical differences between the groups.

This study finds different results than those found in similar studies done on undergraduate athletic training students. The preferred learning style of all the undergraduate students and all the graduate athletic training students is the Diverger learning style. Educators should continue to deliver the material in a variety of ways so that each individual student can utilize his/her preferred style of learning to master the content.

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APPENDIX 1. IRB APPROVAL

NDSU

NORTH DAKOTA STATE UNIVERSITY

Institutional Review Board

*Office of the Vice President for Research, Creative Activities and Technology Transfer
NDSU Dept. 4000
1735 NDSU Research Park Drive
Research 1, P.O. Box 6050
Fargo, ND 58108-6050*

701 231 8995

Fax 701 231 8098

Federalwide Assurance #FWA0001

Wednesday, October 12, 2011

Dr Pamela Hansen
Health, Nutrition & Exercise Sciences
BBF 9C

Re: IRB Certification of Human Research Project:

“Learning Style Preference Between Entry Level Undergraduate and Graduate Athletic Training Students”
Protocol #HE12061

Co-investigator(s) and research team. **Sarah Thon**

Study site(s): **varied** Funding: **n/a**

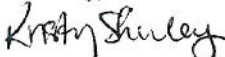
It has been determined that this human subjects research project qualifies for exempt status (category # 2) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*). This determination is based on the protocol form received 10/12/2011 and consent/information sheet received 9/30/2011

Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the research after 10/11/2014, the IRB must re-certify the protocol prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is available on the IRB website
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project
- Any significant new findings that may affect the risks and benefits to participation will be reported in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB policies

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,



Kristy Shirley, CIP, Research Compliance Administrator

APPENDIX 2. LETTER OF PERMISSION

Saturday May 7, 2011 9:36AM

Sarah -

You have my permission to use the Learning Style Questionnaire in you esearch (SIC) at North Dakota State University.

I do request that you provide me with a summary of results after completing you thesis.

Jon Marshall

14008 Golf Course Road
Rapid City, SD 57702
314-898-8205
605-342-2770

In a message dated 5/5/2011 3:00:54 P.M. Mountain Daylight Time, Sarah.Thon@my.ndsu.edu writes:

Dr. Marshall,

As per our phone conversation on the week of April 6th, I would just like to formally ask permission and receive written consent to use the Student Learning Style Questionnaire that you co-wrote with Sharon Merritt in 1985. The survey will be used in my Masters thesis and North Dakota State University on the differences of learning styles between undergraduate and graduate entry level athletic training students. It will be made electronic and emailed to these students across the country in order to broaden the range of my data. Please feel free to contact me by email (sarah.thon@my.ndsu.edu) or by phone (507-330-3109) if you have any questions. Thank you!

Sincerely,

Sarah Thon
Advanced Athletic Training Masters Student, ATC
North Dakota State University
507-330-3109
sarah.thon@my.ndsu.edu

APPENDIX 3. ORIGINAL SURVEY

Student Learning Style Questionnaire

Instructions: Following is a list of 40 word pairs. For each pair, decide which one of the two words is more characteristic of your learning style when compared to the other word. Then decide if the word describes what you generally prefer. If it is *most of the time*, then circle the extreme response ("A" or "E", whichever is appropriate). If it is *over half of the time* but not most of the time, then circle the next response ("B" or "D", whichever is appropriate). If you cannot decide between the two words, circle "C".

	A	B	C	D	E
	Generally (Most of the time)	Over Half the Time	About Half the Time	Over Half the Time	Generally (Most of the time)
1.	Spontaneous		A - B - C - D - E		Thinking
2.	Observation		A - B - C - D - E		Participation
3.	Reserved		A - B - C - D - E		Demonstrative
4.	Sensing		A - B - C - D - E		Thinking
5.	Premonition		A - B - C - D - E		Reason
6.	Active		A - B - C - D - E		Reserved
7.	Participation		A - B - C - D - E		Observation
8.	Watching		A - B - C - D - E		Acting
9.	Observing		A - B - C - D - E		Doing
10.	Deliberative		A - B - C - D - E		Reason
11.	Acting		A - B - C - D - E		Reflecting
12.	Perceptual		A - B - C - D - E		Intellectual
13.	Perform		A - B - C - D - E		Examine
14.	Emotional		A - B - C - D - E		Rational
15.	Consider		A - B - C - D - E		Impulsive
16.	Operative		A - B - C - D - E		Watchful
17.	Reason		A - B - C - D - E		Hunch
18.	Impulsive		A - B - C - D - E		Planning
19.	Produce		A - B - C - D - E		Watch
20.	Witness		A - B - C - D - E		Exhibit

	A	B	C	D	E
	Generally (Most of the time)	Over Half the Time	About Half the Time	Over Half the Time	Generally (Most of the time)
21.	Feeling.....		A - B - C - D - E		Thinking
22.	Ponder.....		A - B - C - D - E		Do
23.	Involved.....		A - B - C - D - E		Distant
24.	Analytical.....		A - B - C - D - E		Emotional
25.	Intuitive.....		A - B - C - D - E		Reasoning
26.	Careful.....		A - B - C - D - E		Emotional
27.	Logical.....		A - B - C - D - E		Sentimental
28.	Perception.....		A - B - C - D - E		Reason
29.	Thinking.....		A - B - C - D - E		Instinctive
30.	Hunch.....		A - B - C - D - E		Logical
31.	Passive.....		A - B - C - D - E		Active
32.	Doing.....		A - B - C - D - E		Watching
33.	View.....		A - B - C - D - E		Execute
34.	Resolving.....		A - B - C - D - E		Feeling
35.	Reflecting.....		A - B - C - D - E		Performing
36.	Intellectual.....		A - B - C - D - E		Emotional
37.	Reflective.....		A - B - C - D - E		Productive
38.	Evaluative.....		A - B - C - D - E		Sensitive
39.	Solve.....		A - B - C - D - E		Reflect
40.	Exercise.....		A - B - C - D - E		View

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APPENDIX 4. PROGRAM DIRECTOR EMAIL

NDSU

North Dakota State University
Health, Nutrition and Exercise Science
PO Box 6050, Dept 2620
Fargo, ND 58108
701-231-8093

Dear Program Director,

My name is Sarah Thon and I am a graduate student in the Advanced Athletic Training Master's Program at North Dakota State University. I would like to invite your program to participate in this research project. All you have to do is forward this email to all of your students (pre and professional levels).

Determining the Learning Style preference of undergraduate and graduate entry level athletic training students is the purpose of this project. Marshall and Merritt's Student Learning Style Questionnaire (1985) based on David A. Kolb's Learning Inventory (1984) will be used. It is a 40 question survey that will take students approximately 10 minutes.

If you have 10 or more students complete the survey, an anonymous overview of their combined learning style preferences will be provided to you. The survey will be open for three weeks. An email will be sent to you to remind you to forward this email to your students. Any questions or for more information please feel free to contact Dr. Pamela Hansen at 701.231.8093 or Pamela.j.hansen@ndsu.edu or Sarah Thon at Sarah.Thon@my.ndsu.edu.

Thank you for forwarding this to your students!

APPENDIX 5. STUDENT EMAIL

Dear Student:

We are conducting a research project to determine the learning style preference between undergraduate and graduate entry level athletic training students.

Because you are either an undergraduate or graduate student enrolled in a CAATE accredited entry level athletic training program, you are being invited to participate in this research project. Your participation is completely your choice, and you may change your mind and quit participating at any time, with no penalty to you.

It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known risks. However, by taking part in this study, you may benefit by learning about your learning style. However, you may not get any benefit from this study. Benefits to others include athletic training educators and their ability to adjust their teaching styles accordingly to better accommodate for your learning style and promote success within the profession.

The survey should take approximately 10 minutes to complete. Demographic questions along with learning style questions make up the survey. By completing this survey you are giving your consent to participate in this study. For your participation, at the end of the survey a separate link will appear if you wish to enter your name and email for chance to win one of two \$25 Best Buy gift cards. Your name or email will not be linked to your survey.

If you have any questions about this project, please contact Dr. Pamela Hansen at 231-8093 or pamela.j.hansen@ndsu.edu or Sarah Thon (NDSU Graduate Student) at sarah.thon@my.ndsu.edu. You have rights as a research participant. If you have questions about your rights or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program at 701.231.8908, ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

Thank you for your participation in this research project!

Please go to the following web address to respond to the survey:
<https://t1.opinio.net:443/s?s=12465&i=61283&k=TUj1&ro=>

APPENDIX 6. REMINDER EMAIL

NDSU

North Dakota State University
Health, Nutrition and Exercise Science
PO Box 6050, Dept 2620
Fargo, ND 58108
701-231-8093

Reminder Email!

Please disregard this email if you have already forwarded to all of your students! We appreciate your participation!

Dear Program Director,

My name is Sarah Thon and I am a graduate student in the Advanced Athletic Training Master's Program at North Dakota State University. I would like to invite your program to participate in this research project. All you have to do is forward this email to all of your students (pre and professional levels).

Determining the Learning Style preference of undergraduate and graduate entry level athletic training students is the purpose of this project. Marshall and Merritt's Student Learning Style Questionnaire (1985) based on David A. Kolb's Learning Inventory (1984) will be used. It is a 40 question survey that will take students approximately 10 minutes.

If you have 10 or more students complete the survey, an anonymous overview of their combined learning style preferences will be provided to you. The survey will be open for three weeks. An email will be sent to you to remind you to forward this email to your students. Any questions or for more information please feel free to contact Dr. Pamela Hansen at 701.231.8093 or Pamela.j.hansen@ndsu.edu or Sarah Thon at Sarah.Thon@my.ndsu.edu.

Thank you for forwarding this to your students!

APPENDIX 7. SURVEY DISTRIBUTED

Learning Style Preference Between Undergraduate and Graduate Entry Level Athletic Training Students

NDSU North Dakota State University
Health, Nutrition and Exercise Science
PO Box 6050, Dept 2620
Fargo, ND 58108
701-231-8093

Dear Student:

We are conducting a research project to determine the learning style preference between undergraduate and graduate entry level athletic training students.

Because you are either an undergraduate or graduate student enrolled in a CAATE accredited entry level athletic training program, you are being invited to participate in this research project. Your participation is completely your choice, and you may change your mind and quit participating at any time, with no penalty to you.

It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known risks. However, by taking part in this study, you may benefit by learning about your learning style. However, you may not get any benefit from this study. Benefits to others include athletic training educators and their ability to adjust their teaching styles accordingly to better accommodate for your learning style and promote success within the profession.

The survey should take approximately 10 minutes to complete. Demographic questions along with learning style questions make up the survey. By completing this survey you are giving your consent to participate in this study. Please click on the start button to participate.

For your participation, at the end of the survey a separate link will appear if you wish to enter your name and email for chance to win one of two \$25 Best Buy gift cards. Your name or email will not be linked to your survey.

If you have any questions about this project, please contact Dr. Pamela Hansen at 231-8093 or pamela.j.hansen@ndsu.edu or Sarah Thon (NDSU Graduate Student) at sarah.thon@my.ndsu.edu. You have rights as a research participant. If you have questions about your rights or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program at 701.231.8908, ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

Thank you for your participation in this research project!

[Start](#)

Powered by
[Opinio Survey Software](#)

Learning Style Preference Between Undergraduate and Graduate Entry Level Athletic Training Students Demographic

1. Education Level:

- Undergraduate Graduate

2. Age:

- 18 19 20 21 22 23 24 25 26 27
 28 29 30+

3. Gender:

- Male Female

4. Year Currently in School:

- Undergraduate Graduate

5. What Semester did you start the Athletic Training program?

- Fall Summer Spring

6. Undergraduate Degree: Athletic Training

Graduate Degree: Graduate Degree

Graduate Students Undergraduate Major: Graduate Students Undergraduate Major:

Please specify other:

7. How many semesters of Athletic Training classroom experiences have you completed?

- 0-1 2-3 4 +4

8. How many Athletic Training Courses have you completed since starting your program (including Clinical Experience Courses)

- 1-2 3-4 5-6 7-8 9-10 11-12

9. Clinical Experience Sites Completed (please check all that apply)

- Gen. Med
 Low risk (golf, tennis, cross country, indoor and outdoor track, baseball, softball and swimming)
 Moderate Risk (volleyball, basketball, soccer, wrestling and gymnastics)
 Equipment intensive/High Risk (Football and Hockey)
 Female Sport
 Male Sport
 High School
 Other

10. Institution:

Next

Powered by

Learning Style Preference Between Undergraduate and Graduate Entry Level Athletic Training Students

Instructions: Following is a list of 40 word pairs. For each pair, decide which one of the two words is more characteristic of your learning style when compared to the other word. Then decide if the words describes what you generally prefer. If it is most of the time, then pick the extreme response ("1" or "5", whichever is appropriate). If it is over half of the time but not most of the time, then pick the next response ("2" or "4", whichever is appropriate). If you cannot decide between the two words, pick "3".

1	2	3	4	5
Generally (Most of the time)	Over Half The Time	About Half the Time	Over Half the Time	Generally (Most of the time)

11.

Spontaneous 1 2 3 4 5 Thinking

12.

Observation 1 2 3 4 5 Participation

13.

Reserved 1 2 3 4 5 Demonstrative

14.

Sensing 1 2 3 4 5 Thinking

15.

Premonition 1 2 3 4 5 Reason

16.

Active 1 2 3 4 5 Reserved

17.

Participation 1 2 3 4 5 Observation

18.

Watching 1 2 3 4 5 Acting

19.

Observing 1 2 3 4 5 Doing

20.

Deliberative 1 2 3 4 5 Reason

21.

Acting 1 2 3 4 5 Reflecting

22. 1 2 3 4 5
Perceptual Intellectual

23. 1 2 3 4 5
Perform Examine

24. 1 2 3 4 5
Emotional Rational

25. 1 2 3 4 5
Consider Impulsive

26. 1 2 3 4 5
Operative Watchful

27. 1 2 3 4 5
Reason Hunch

28. 1 2 3 4 5
Impulsive Planning

29. 1 2 3 4 5
Produce Watch

30. 1 2 3 4 5
Witness Exhibit

31. 1 2 3 4 5
Feeling Thinking

32. 1 2 3 4 5
Ponder Do

33. 1 2 3 4 5
Involved Distant

34. 1 2 3 4 5
Analytical Emotional

35. 1 2 3 4 5
Intuitive Reasoning

1 2 3 4 5
Careful Emotional

37.

1 2 3 4 5
Logical Sentimental

38.

1 2 3 4 5
Perception Reason

39.

1 2 3 4 5
Thinking Instinctive

40.

1 2 3 4 5
Hunch Logical

41.

1 2 3 4 5
Passive Active

42.

1 2 3 4 5
Doing Watching

43.

1 2 3 4 5
View Execute

44.

1 2 3 4 5
Resolving Feeling

45.

1 2 3 4 5
Reflecting Performing

46.

1 2 3 4 5
Intellectual Emotional

47.

1 2 3 4 5
Reflective Peoductive

48.

1 2 3 4 5
Evaluative Sensitive

49.

1 2 3 4 5
Solve Reflect

50.

1 2 3 4 5
Exercise View

APPENDIX 8. FUNDING EMAIL

Tuesday, January 31, 2012 12:33 PM

Dear Sarah,

Congratulations! The Athletic Training faculty has reviewed your MS thesis funding proposal and has agreed to award you \$50 for your gift cards! Please work closely with your advisor and follow the guidelines of the MS in Advanced Athletic Training Thesis Funding handout on Blackboard!

If you have any questions, please feel free to contact me!

Best of luck with your research project!

Pam

Pamela J. Hansen, EdD, ATC, LAT

Associate Professor//Athletic Training Program Director

Department of Health, Nutrition, and Exercise Sciences

NORTH DAKOTA STATE UNIVERSITY

p: 701.231.8093//f:701.231.8872//www.ndsu.edu

APPENDIX 9. UNDERGRADUATE INSTITUTIONS

*Five individuals did not answer this question

Table 1.
Undergraduate Institutions

School	Number (N=424)*
Adrian College	3
Alma College	7
Anderson University	4
Angelo State University	1
Aquinas College	4
Aurora University	7
Azusa Pacific College	1
Bethany College	1
Bethel College	4
Bethel University	4
Brigham Young University	10
Buena Vista University	5
California State University-Fresno	6
California State University-Northridge	1
California University of Pennsylvania	5
Campbell University	5
College of Mount St. Joseph	6
Concordia University Wisconsin	3
Concordia University-Irvine	8
Dakota Wesleyan University	9
East Carolina University	4
Eastern Kentucky University	8
Frostburg State University	5
Georgia Southern University	10
Gustavus Adolphus College	7
Heidelberg University	7
Illinois State University	4
Indiana State University	1
James Madison University	4
King College	3
King's College	2
Lees-McRae College	3
Loras College	8
Loyola Marymount University	2
Marietta College	5
Marywood University	5
McNeese State University	2
Minnesota State University-Mankato	7

Nebraska Wesleyan University	2
Nicholls State University	7
North Carolina Central University	2
North Dakota State University	1
Northeastern University	5
Ohio University	6
Olivet Nazarene University	3
Pennsylvania State University	9
Purdue University	7
Radford University	8
SUNY-Cortland	8
Salisbury University	7
Slippery Rock University	9
Southeast Missouri State University	6
Southern Connecticut State University	1
Southern Illinois University	3
Southern Utah University	2
Stephen F. Austin State University	1
Temple University	7
Texas A&M University-Commerce	5
Texas Christian University	3
Tusculum College	3
University of Central Florida	2
University of Charleston	6
University of Cincinnati	1
University of Connecticut	3
University of Findlay	1
University of Indianapolis	3
University of Minnesota-Duluth	9
University of Mount Union	9
University of Nebraska-Omaha	2
University of North Dakota	3
University of Northern Iowa	13
University of South Carolina	5
University of Texas at Austin	5
University of West Florida	7
University of Wisconsin-Eau Claire	12
University of Wisconsin-Stevens Point	6
University of Wisconsin-Milwaukee	8
University of Wisconsin-Oshkosh	5
University of the Pacific	9
University of Tulsa	4
Washington State University	6
Weber State University	8
West Virginia Wesleyan College	2
Western Illinois University	1

Wheeling Jesuit University	7
William Paterson University	1

APPENDIX 10. GRADUATE INSTITUTIONS

*Five individuals did not answer this question

Table 2.
Graduate Institutions

School	Number (N=64)*
Arkansas State University	1
California Baptist University	4
Concord University	1
Florida International University	3
McNeese State University	1
Montana State University-Billings	1
Nicholls State University	1
Ohio State University	8
Shenandoah University	6
Steven F. Austin State University	10
University of Arkansas	11
University of Findlay	5
University of Nebraska-Omaha	5
University of North Carolina-Greensboro	1
University of South Carolina	3
University of Wisconsin-Madison	1
Weber State University	7