PERCEPTION OF THE CERTIFIED ATHLETIC TRAINER’S ABILITY TO PERFORM IN THE INDUSTRIAL SETTING

THESIS

Submitted to the Faculty of the School of Graduate Studies and Research of California University of Pennsylvania in partial fulfillment of the requirements for the degree of Master of Science

By
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THESIS APPROVAL

Athletic Training

We hereby approve the Thesis of

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4/25/05              Dr. Bruce Barnhart - Committee Member

4/25/05              Prof. B. McGlumphy - Committee Member
ACKNOWLEDGEMENTS

"To steal ideas from one person is plagiarism; to steal from many is research" - Unknown

Now is the time that I have been looking forward to, thanking everyone for their time, efforts and support in helping me complete this thesis. It was a stressful time, but there a few key people that have helped me through.

I am going to have to start by thanking my parents! Thank you for supporting me in this final scholastic endeavor of mine. I love you so much and appreciate all that you have done and continue to do for me. Thank you to the rest of my family for your love and support as well.

A special thank you to Mark and Mike Lesako, and everyone at Washington and Jefferson College. I could not have asked for a better working environment. I thoroughly enjoyed my time at work and I appreciate all the learning experiences you allowed me throughout the year.

Now, to my little salvations, the gang. I don’t know what I would have done without you guys being here. To Amy, thank you for everything, I truly could not have made it through this year without you. To Bob, Nick and Kevin, thank you for enlightening me on the New England culture, and constantly entertaining me with your crazy antics.

Thank you to my committee and a special thank you to Carol Biddington, who although is not on my committee has put in countless hours of advising and editing on my paper.
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INTRODUCTION

The economic stability of a company relies on the vitality of its employees. When a company is unable to function because the employees are not working due to injuries, they are not able to turn a profit. If an employer had the opportunity to implement programs that would prevent injuries, should they take it? If there was an opportunity for the employer to help the employees receive treatment in a timely fashion and possibly return to work sooner, should they do it?

Athletic trainers have been educated with the idea that it is their priority to return an athlete to play as soon as possible, but not until they are able to function at 100% of their capacity. It is that sort of training that makes a Certified Athletic Trainer (ATC) a perfect fit in the occupational setting, and not just the athletic. By performing a job analysis and implementing preventative training, they are able to cut down on the number of injuries that are occurring and, by being present, they are able to treat the employees as soon as they have an acute injury.

Is the education of an undergraduate program enough for an ATC to be adequately prepared for the sort of underlying medical issues that may be involved with an
older and less physically active population? Should there be additional training implemented in the general education of all athletic trainers, or should there be a special education program for those who are interested in working in the industrial or occupational setting? Is it fair to include extra courses for those who are not interested in working outside of the athletic population? Do the athletic trainers in the occupational setting believe they were adequately educated to recognize and treat the types of injuries and ailments that they see, or have they had to seek additional training? If they have had to seek additional training, what types do they think to be most beneficial? Do they believe that additional certifications would prove beneficial in the industrial setting, or are they just for hiring purposes?

Over the past 50 years, the education for athletic trainers has undergone some drastic changes regarding curriculum models, clinical hours, and accreditation. All of these changes have been focused on making the profession of athletic training more marketable and respectable.

Perhaps the largest educational modification was the progress towards every institution with an athletic training education program being accredited by the Commission on Accreditation of Allied Health Education
Programs (CAAHEP) with recommendations from the Joint Review Committee on Educational Programs in Athletic Training (JRC-AT). This movement not only creates a stricter educational environment, but also minimizes the number of contact hours in the clinical setting. With the stringent guidelines for approval of accreditation, it is mandatory that the programs allow every opportunity of experience through the clinical placements.\(^2\)

Is the time in the clinical setting utilized by the students though? According to Berry et al\(^3\), the utilization of time spent in the clinical setting depends on where the students are placed and if their clinical instructors take full advantage of teaching opportunities. With competencies, set standards, and guidelines, it is necessary to cover certain material in allotted times.\(^2\)

Along with the undergraduates’ education, there is also a concern about adult continuing education. Learning styles change as we grow older and it is important to keep up with the needs of the profession as well. There are conferences and quizzes on almost any topic imaginable, but how many of these opportunities are actually practical and related to the field of athletic training? Most times, it is a consideration of time and amount of continuing education units (CEUs), instead of content that attracts
Education is a never ending battle throughout jobs and careers. It is important to learn as much about your profession as possible. The athletic training profession has been changing over the years as well. Instead of working explicitly within the athletic population, there are other options, mainly working with the occupational population.

What exactly does an industrial athletic trainer do that is different than a general ATC? Industrial athletic trainers are responsible for more than acute injury treatment. There are a variety of responsibilities that can be considered out of the range of normal ATC responsibilities. Being in a clinical setting makes it a priority for the industrial athletic trainer to be competent with insurance plans and billing processes. Also, there is the ergonomic element. It has been stated that the repetitive motions encountered in the work force cause the same overuse type injuries that athletes experience.

The industrial athletic trainer must be able to apply their knowledge of prevention of injuries, one of the six domains of athletic training, to the employee and their workstation. A job site analysis is an available tool used
to evaluate postural stresses placed upon an individual’s body while performing certain tasks. Usually the employee is videotaped performing their job and specialized equipment is used to measure the forces that they exert or take on. Based on the information gathered, it is determined whether there are possible changes that can be made to the workstation to prevent future injuries.\textsuperscript{6,7}

It is important for the athletic trainer to be able to show that there is a decrease in the prevalence of injuries to help prove they are being correctly compensated. Ways to show cost effectiveness range from showing a change in dollar amounts paid in worker’s compensation payments, to showing a decrease in days of missed work, and even showing a decrease in the amount of money spent on medical treatments.\textsuperscript{8}

Why is there such a mission to prevent and treat work related injuries? As of 2003, the total overall cost of healthcare expenses was estimated to be in excess of $1 trillion. This cost includes direct and indirect healthcare costs. Direct costs include anything dealing with the treatment and rehabilitation of the injured employee. Indirect costs is a term used to measure the loss of productivity to the employer by having an employee out of commission due to injury. An ATC is the perfect
solution to this problem, since they specialize in
preventing, treating, and rehabilitating injuries, as well
as implementing conditioning programs.\textsuperscript{9}

Once the ATC is practicing within the occupational
setting, there are certain preventative measures that need
to be taken to make sure that employees are avoiding as
many injuries as possible. As mentioned before, a job site
analysis can be utilized, but the fundamentals behind that
is the exploration of ergonomics. Ergonomics can be simply
stated as changing the workstation around the employee
instead of vice versa.\textsuperscript{10}

In addition to having knowledge of ergonomics, it is
important for the industrial athletic trainer to stay
current with medical diseases and medications for employees
who have other medical problems. It has been reported that
physical and emotional health plays a very important role
in a worker’s productivity. By becoming knowledgeable and
preparing oneself for the complexities of working with a
population that is prone to more diseases and health risks
than an active population, an industrial athletic trainer
may help to improve workers’ productivity.\textsuperscript{11}

There are many methods of ensuring companies that
hiring an ATC will be beneficial for them, not only for
employees’ health, but also for their economic gains.
Several studies have shown that overall there is a positive return on investment and a general decrease in the amount and severity of injuries.\textsuperscript{12,13} Employers are not the only ones that are happy with this situation though. The National Athletic Trainers’ Association (NATA) surveyed clinical industrial and corporate (CIC) ATCs to find out how they rated their job satisfaction and why. The top reasons for choosing a job in the CIC setting are salary and hours. Job satisfaction is overwhelmingly satisfied, even though some responded that within five years they will be looking for a new profession. This was, however, mainly due to the fact that they will be returning to school.\textsuperscript{14}

Previous research seems to show that it is a positive situation for everyone involved in this new movement of industrial athletic training. Even though the education for athletic training programs has gone under several changes in the past years, there seem to be areas that are not covered in the undergraduate athletic training education. Since the industrial athletic trainer is working with a population that has more health risks and may have underlying diseases, it seems necessary to have a greater knowledge in those areas.

This study will attempt to answer the following research questions: 1) What is the relationship between
the age of the athletic trainer and the perception of their ability to perform their job as an industrial athletic trainer? 2) Are there differences between gender for perception of ability to perform as an industrial athletic trainer? 3) What is the relationship between number of years certified and perception of ability to perform as an industrial athletic trainer, and 4) Are there differences among education level for perception of ability to perform as an industrial athletic trainer?
METHODS

The methods section of this study will describe the procedures used to conduct this research study. This chapter includes sections explaining the research design, participants, panel of experts, instruments, procedures, hypotheses, and data analysis.

Research Design

The design for this research study was a descriptive study. The dependent variable that was measured is the perception of ability to perform as a Certified Athletic Trainer in the industrial setting. Independent variables included age, gender, number of years certified, and a combination of higher education and additional certifications. The strength of this study was the ability to survey all ATCs who are working in the CIC setting as indicated by their NATA membership. Although not all ATCs are members of the NATA, there is a high percentage of representation. One limitation considered was the fact that there was no existing survey to be used; therefore, one was created based on the information that was acquired, and other surveys that covered similar material.
Participants

The participants (N=123) are Certified Athletic Trainers who have indicated their employment status as either clinical, industrial, corporate, clinical/corporate or clinical/industrial through the NATA. These people are all in good standing with the NATA. The only limitation to this study was the fact that there are those working in the industrial setting who are not members of the NATA and could not be contacted. Informed consent was implied when the subjects voluntarily completed the questionnaire.

Panel of Experts

The researcher asked three members to serve as the panel of experts to approve of the instrument to be used, and strengthen the content validity. There was a letter to the members of the panel (Appendix C1) included with the pending instrument. The members of the panel of experts, Craig Halls MBA, ATC, Sue Finkam MS, ATC, and Matthew Ficca ATC, were chosen based on their knowledge and participation in athletic training at the industrial setting.
Instruments

The researcher created the Competence of an Industrial Athletic Trainer Questionnaire (Appendix C2). The first section of the survey consisted of eight demographic questions. The second section addressed the ATC’s perception of ability to perform in the industrial setting. There are 28 questions on a Likert scale that can give a total score from 28 to 140.

The demographic section of the survey consists of questions that pertain to the respondents’ gender, age, years of experience, undergraduate education, certifications, level of education, and current employment status. The second section of the survey attempts to measure perception of ability to perform in the industrial setting. The duties that are listed were taken from job descriptions that were posted on the NATA website, and feedback from the panel of experts. Duties included administrative tasks, acute treatment of injuries, ergonomic evaluation, job site analysis and use of orthopedic devices. The respondents answered the questions based on how competent they are completing the previously mentioned tasks. Answers included very competent, competent, moderately competent, minimally competent, and
not competent.

Procedures

The researcher applied for and received approval by the Institutional Review Board (Appendix C3) at California University of Pennsylvania before conducting any of the research. The study was distributed through an email broadcast to all members of the NATA that are recognized as working in the CIC setting. The survey was accompanied by a cover letter (Appendix C4) explaining the purpose of the study and asking for the assistance of the recipients in completing the survey. Results were returned to the researcher in a anonymous manner, and the statistical data was analyzed. Additional mailings were implemented until a return of at least 40% was achieved.

Hypotheses

The following hypotheses are based on a review of the literature and the intuition of the researcher.
1) There will be a negative relationship between age of the athletic trainer and the perception of their ability to perform as an industrial athletic trainer.
2) There will be no differences between gender for their perception to perform as an industrial athletic trainer.

3) There will be a positive relationship between number of years certified and perception of ability to perform as an industrial athletic trainer.

4) Certified Athletic Trainers with additional education will have a higher perception of ability to perform as an industrial athletic trainer as compared to those without additional education.

Data Analysis

The level of significance was set at $\alpha=.05$ to test the acceptability of the stated hypotheses.

Hypothesis 1: A Pearson Product Moment Correlation was used to determine if there was a negative relationship between the age of the athletic trainer and the perception of their ability to perform as an industrial athletic trainer.

Hypothesis 2: An independent $t$-test was used to determine if there was no difference between gender for their perception to perform as an industrial athletic trainer.
Hypothesis 3: A Pearson Product Moment Correlation was used to determine if there was a positive relationship between number of years certified and perception of ability to perform as an industrial athletic trainer.

Hypothesis 4: An independent t-test was used to determine if Certified Athletic Trainers with additional education had a higher perception of ability to perform as an industrial athletic trainer as compared to those without additional education.
RESULTS

Demographic Data

The sample consisted of Certified Athletic Trainers who are in good standing with the National Athletic Trainers’ Association and indicated that they are employed in the Corporate, Industrial, or Clinical/Industrial setting. The entire population consisted of 779 members, of which 123 responded. The sample consisted of 72 males and 51 females (Table 1). The age range of the subjects within this population was 23 to 54 years of age (32.26 ±6.824).

Table 1. Frequency Table of Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>72</td>
<td>58.5</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>41.5</td>
</tr>
</tbody>
</table>

The range of years working as a Certified Athletic Trainer was 1 to 26 years (8.59 ± 5.663). The range of years working as a Certified Athletic Trainer in the Industrial Setting was 0 to 18 years (4.13 ± 4.447).

Table 2 reports the findings for which route to certification they took, whether their institution that they graduated from had an accredited Athletic Training Education Program or they pursued the internship route.
Table 2. Route to BOC certification

<table>
<thead>
<tr>
<th>Route</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accredited</td>
<td>68</td>
<td>55.3</td>
</tr>
<tr>
<td>Internship</td>
<td>55</td>
<td>44.7</td>
</tr>
</tbody>
</table>

Not all subjects were certified in First Aid, Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillation (AED). Those who were not were eliminated. Testing was done to examine whether or not additional certifications added to the perception of ability to perform as an industrial athletic trainer. Additional certifications included: Emergency Medical Technician (EMT), Certified Ergonomic Evaluation Specialist (CEES), Certified Ergonomics Associate (CEA), Certification in Industrial Ergonomics (CIE), Certified Functional Capacity Evaluator (CFCE), Certified Work Capacity Evaluator (CWCE), Certified Occupational Safety Specialist (COSS), American College of Sports Medicine Health Fitness Instructor (ACSM, HFI), Performance Enhancement Specialist (PES), Certified Lifeguard, Phototherapy Certification, Certified Ergonomics Technician (CFT), Aquatic Therapy Certification, Board Orthotist Certified (BOC), Medical First Responder, Clinical Exercise Physiologist, Certified Strength and Conditioning Specialist (CSCS), Certified Weight Training, Massage Therapist, Personal Trainer, Certified Nursing
Assistant, Certified Functional Job Analysis (CFJA), and Certified Physician Assistant. Table 3 shows the frequencies of additional certifications. The most frequently answered additional certification was Certified Strength and Conditioning Coach (CSCS) with 8 respondents, the second highest was Personal Trainer with 4 respondents and third highest was Licensed Physical Therapist with 3 respondents.

Table 3. Additional Certifications

<table>
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<tr>
<th>Additional Certifications</th>
<th>Frequency</th>
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<tr>
<td>0</td>
<td>79</td>
<td>64.2</td>
</tr>
<tr>
<td>1</td>
<td>35</td>
<td>28.5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>4.1</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3.3</td>
</tr>
</tbody>
</table>

There was one respondent who answered that he/she had earned his/her Doctorate, but they were excluded for analysis purposes. All other respondents earned at least a Bachelors if not a Masters degree. Table 4 reports the frequency of those who have earned an additional degree.

Table 4. Additional Education

<table>
<thead>
<tr>
<th>Additional Education</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelors</td>
<td>55</td>
<td>44.7</td>
</tr>
<tr>
<td>Masters</td>
<td>68</td>
<td>55.3</td>
</tr>
</tbody>
</table>
Hypotheses Testing

All hypotheses were tested at an alpha level of 0.05.

Hypothesis 1: There will be a negative relationship between age of the athletic trainer and the perception of their ability to perform as an industrial athletic trainer.

A Pearson Product Moment Correlation was used to determine if there was a negative relationship between the age of the athletic trainer and the perception of their ability to perform as an industrial athletic trainer.

Conclusion: A Pearson correlation coefficient was calculated for the relationship between subjects’ age and perception of ability. A weak negative correlation was found ($r(121) = -.235, P < .01$), indicating a significant inverse linear relationship between the two variables. The older the Certified Athletic Trainer was, the lower their perceived ability to work in the industrial setting.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Correlation Coefficient</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &amp; Perception</td>
<td>123</td>
<td>-.235</td>
<td>.009*</td>
</tr>
</tbody>
</table>

* $P < .01$
Hypothesis 2: There will be no differences between gender for their perception to perform as an industrial athletic trainer.

An independent $t$-test was used to determine if there was no difference between gender for their perception to perform as an industrial athletic trainer.

Conclusion: An independent $t$-test was calculated comparing the mean Likert scale scores for males to the Likert scale scores for females. No significant difference was found ($t(121) = -.608, P > .05$). The mean of males (59.17, ±13.882) was not significantly different from the mean of the females (60.92, ±18.14).

Table 6. Independent $t$-test comparing Likert scale scores between gender.

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>72</td>
<td>59.17</td>
<td>13.88</td>
<td>-.608</td>
<td>.545</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>60.92</td>
<td>18.14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3: There will be a positive relationship between number of years certified and perception of ability to perform as an industrial athletic trainer.

A Pearson Product Moment Correlation was used to determine if there was a positive relationship between number of years certified and perception of ability to perform as an industrial athletic trainer.
Conclusion: A Pearson correlation coefficient was calculated for the relationship between the subjects amount of years certified and their ability to perform as an industrial athletic trainer. A weak negative relationship was found ($r(121) = -.215, P < .05$), indicating a significant inverse linear relationship between the two variables. Certified Athletic Trainers with more years experience have a lower perception of ability to perform as an industrial athletic trainer.

Table 7. Correlation Coefficient for Years Certified and Perception

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Correlation Coefficient</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years Experience &amp; Perception</td>
<td>123</td>
<td>-.215</td>
<td>.017*</td>
</tr>
</tbody>
</table>

*$P < .05$

Hypothesis 4: Certified Athletic Trainers with additional education will have a higher perception of ability to perform as an industrial athletic trainer as compared to those without additional education.

An independent $t$-test was used to determine if Certified Athletic Trainers with additional education had a higher perception of ability to perform as an industrial
athletic trainer as compared to those without additional education.

**Conclusion:** An independent t-test was used to compare perception of ability between Certified Athletic Trainers who have additional education and those who do not ($t(121) = 2.943, P < .01$). The mean of Certified Athletic Trainers earning only a Bachelor’s (64.40, ±16.91) was significantly higher than the mean of Certified Athletic Trainers earning a Bachelor’s and a Master’s (56.25, ±13.80).

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s</td>
<td>55</td>
<td>64.40</td>
<td>16.913</td>
<td>2.943</td>
<td>.004*</td>
</tr>
<tr>
<td>Master’s</td>
<td>68</td>
<td>56.25</td>
<td>13.803</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .01

**Additional Findings**

An additional Pearson Moment Correlation and independent t-test were completed to obtain additional findings.

A relationship was calculated comparing years of experience in the industrial setting and perception of ability based on the Likert scale score. A Pearson
correlation coefficient was calculated for the relationship between experience and perception. A weak negative relationship was found \( r(121) = -.274, P < .01 \), indicating a significant inverse linear relationship between the two variables.

Table 9. Correlation Coefficient for Years experience in the industrial setting and perception based on Likert scale score

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Correlation Coefficient</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience &amp; Perception</td>
<td>123</td>
<td>-.274</td>
<td>.002*</td>
</tr>
</tbody>
</table>

*P < .01

An independent t-test was calculated comparing the means of Likert scale scores of Certified Athletic Trainers that took the accredited route to BOC certification and Likert scale scores of those who took the internship route to BOC certification \( t(121) = 2.410, P < .05 \). The mean score of Certified Athletic Trainers who took the accredited route to BOC certification (62.91, ±16.25) was significantly higher than the mean of Certified Athletic Trainers who took the internship route to BOC certification (56.16, ±14.36).
Table 10. Independent t-test Comparing Certified Athletic Trainers who Took Accredited or Internship Route to BOC Certification

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accredited</td>
<td>68</td>
<td>62.91</td>
<td>16.25</td>
<td>2.41</td>
<td>.017*</td>
</tr>
<tr>
<td>Internship</td>
<td>55</td>
<td>56.16</td>
<td>14.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05

From the data gathered through the Perception of Ability portion of the questionnaire, additional testing was done to see how competent certified athletic trainers perceive themselves working in the industrial setting. A one way analysis of variance (ANOVA) was utilized to determine if there was significance between the answers of the 28 different Likert scale questions. The findings showed significance between groups $F(27, 3416) = 30.70$.

Table 11. Significance of Difference between questions

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of Squares</th>
<th>$F$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>27</td>
<td>836.59</td>
<td>30.70</td>
<td>.000*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3416</td>
<td>3447.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3443</td>
<td>4284.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .01

From the Post Hoc Testing (Tukey HSD), it was shown that questions 7, 12, 8, 6, 15, 14, 16, 25, and 17 all had similar scores ranging from 1.41 to 1.85 with question 7 being the lowest. That question asked the subject to rate their competence communicating with employees. Questions
9, 4, 11, 24, 23, and 10 all had the highest range of scores, 2.68 to 3.14 with question 10 being the highest. Question 10 had the subjects rate their competence for reimbursement documentation.

Below is a table representing each question, the mean score, standard deviation and the percentage of subjects that answered four or five for the questions, meaning they felt competent or very competent respectively.
Table 12. Frequency table for Likert scale data

<table>
<thead>
<tr>
<th>Likert Scale Question</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>Percentage answering 4 or 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.12</td>
<td>.802</td>
<td>2.4</td>
</tr>
<tr>
<td>2</td>
<td>2.31</td>
<td>.932</td>
<td>9.7</td>
</tr>
<tr>
<td>3</td>
<td>2.41</td>
<td>1.05</td>
<td>11.3</td>
</tr>
<tr>
<td>4</td>
<td>2.75</td>
<td>1.01</td>
<td>20.1</td>
</tr>
<tr>
<td>5</td>
<td>1.94</td>
<td>.965</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>1.45</td>
<td>.758</td>
<td>3.2</td>
</tr>
<tr>
<td>7</td>
<td>1.40</td>
<td>.732</td>
<td>3.2</td>
</tr>
<tr>
<td>8</td>
<td>1.42</td>
<td>.688</td>
<td>7.3</td>
</tr>
<tr>
<td>9</td>
<td>2.65</td>
<td>1.30</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>3.10</td>
<td>1.40</td>
<td>42</td>
</tr>
<tr>
<td>11</td>
<td>2.81</td>
<td>1.42</td>
<td>30.7</td>
</tr>
<tr>
<td>12</td>
<td>1.43</td>
<td>.745</td>
<td>8.8</td>
</tr>
<tr>
<td>13</td>
<td>1.95</td>
<td>.854</td>
<td>4</td>
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<tr>
<td>14</td>
<td>1.77</td>
<td>.787</td>
<td>15.3</td>
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<tr>
<td>15</td>
<td>1.58</td>
<td>.755</td>
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<tr>
<td>16</td>
<td>1.75</td>
<td>.993</td>
<td>5.6</td>
</tr>
<tr>
<td>17</td>
<td>1.79</td>
<td>.948</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>2.23</td>
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<td>10.5</td>
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<td>19</td>
<td>2.23</td>
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<td>20</td>
<td>2.22</td>
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<tr>
<td>22</td>
<td>2.40</td>
<td>1.04</td>
<td>11.2</td>
</tr>
<tr>
<td>23</td>
<td>3.02</td>
<td>1.18</td>
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<tr>
<td>24</td>
<td>2.90</td>
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</tr>
<tr>
<td>25</td>
<td>1.77</td>
<td>.756</td>
<td>17.7</td>
</tr>
<tr>
<td>26</td>
<td>2.20</td>
<td>.996</td>
<td>11.3</td>
</tr>
<tr>
<td>27</td>
<td>2.16</td>
<td>1.06</td>
<td>11.3</td>
</tr>
<tr>
<td>28</td>
<td>2.14</td>
<td>1.06</td>
<td>12.1</td>
</tr>
</tbody>
</table>
DISCUSSION

Discussion of Results

This study focused on the perception of the ability of the Certified Athletic Trainer to work in the industrial setting. Research has been completed dealing with their overall effectiveness when it comes to economic value, but there is little to no research on their perceived ability to work in this setting. All research that has been done dealing with return on investment has shown that companies that employ Certified Athletic Trainers have shown gains where there were previous financial losses.

The results of the Competence of an Industrial Athletic Trainer Questionnaire are subjective and some subjects may actually be more or less competent than they believe. Since this is not a standardized surveying instrument, there is margin for error in assessing the subjects’ true perception of ability. Items that they were asked to rate their competence on are based on items listed in job descriptions by several employers on the NATA career center website, and feedback from a panel of experts.

This study found that older Certified Athletic Trainers believed that they were less competent working in the industrial setting. Usually with age comes wisdom, or
so the saying goes. But in this case, younger athletic trainers may believe that their education was geared more towards a diverse occupational setting. The researcher hypothesized the negative relationship due to the fact that the role of the athletic trainer in the industrial setting is a fairly new development and that younger certified athletic trainers would feel more competent to work in the industrial setting.

Despite the age, there was no difference between gender for the perception of ability, based on the Likert scale scores. The researcher thought that the industrial setting would be an open and non-discriminatory setting in which there would not be the perceived discrimination of women to work with different groups of people, this comment is in reference to the lack of women working with professional male sports teams. In the industrial setting there is equal opportunity for men and women to advance, therefore the researcher thought that there would be no difference in perception of ability.

According to the research, there was a negative relationship between the number of years certified and the perception of ability to perform as an industrial athletic trainer. Meaning that the younger the athletic trainer the higher the competence to perform as an industrial athletic
trainer. The age range of the subjects was 31 years (min = 23, max = 54). Within these 31 years, the NATA has made substantial changes with the educational curriculum that is required to be met in order to even be able to sit for the BOC certification exam. It is possible within these years that the education has evolved and made the younger population more competent to address the diverse dealings of the occupational setting.

The final hypothesis was dealing with factor of additional education. Additional education would be anything beyond the required Bachelor’s to sit for the BOC certification exam. There were a few subjects that responded that they had also earned an associates degree and one that had earned a doctorate, but they were eliminated due to the small percentage. The independent t-test was then chosen to test if there was significance between the Likert scale scores of those who had earned a bachelor’s only and the score of those who have gone on to earn their master’s as well. The researcher thought that there would be a higher level of competence in those who have pursued a higher degree. The opposite actually proved true, those earning only a Bachelor’s have a significantly higher perception of ability to perform as an industrial athletic trainer. Possible reasoning for this may be that
the higher degree was earned in something not pertaining to athletic training, or the industrial setting in some way. Subjects were asked to respond with the title of their degree, but not all of the respondents took time to type this out, therefore the earned degree was not recordable variable.

From the information that was gathered, there were two additional tests that were done. The first test was comparing years of experience in the industrial setting and perception of ability based on the Likert scale score. A weak negative relationship was found, meaning that the longer the subject has worked in the industrial setting, the less competent they perceive themselves to be. Two subjects responded that they have worked in the industrial setting for 18 years, the highest value, and only 22.8% have worked in the industrial setting for more than five years. This negative relationship then may have been skewed by the lack of subjects who have worked in the industrial setting for extended amounts of time.

The final test compared the Likert scale scores for those who took the internship route to BOC certification and those who graduated from an accredited Athletic Training education program. An independent t-test was done to compare the scores. The results show that those who
took the accredited route to BOC certification scored significantly higher than those who took the internship route. One possible reason for this is that the accredited athletic training educational programs have classes that pertain to more diverse occupational settings. There may also be more opportunities for interaction and/or lecture with those who are qualified or trained in such items as listed in the survey.

This survey was sent out to 779 members who indicated working in the corporate, industrial or clinical setting. The sample population size was 260, of those a 40% return was needed, totaling 104. Total returned equaled 123, of those, 32 of them responded to having no experience in the industrial setting. This is possible due to the mailing of all those who have indicated working in the corporate and clinical settings also. Therefore, results pertaining to perception of ability may be skewed since only 74% of the subjects actually have industrial experience.

Some recommendations for future research in this area would be to make sure that the subjects are active in the corporate, industrial or clinical setting and working with clients who are comparable to industrial employees. In addition, keep track of subjects that have earned additional degrees in fields related to athletic training
and test for significant differences in the Likert scale scores.

Conclusions

The results of the study revealed the following major conclusions:

1) Certified Athletic Trainers who are older have a lower perception of ability to perform as an industrial athletic trainer than younger Certified Athletic Trainers.

2) There was no significant difference between gender for perception of ability to perform as an industrial athletic trainer.

3) Certified Athletic Trainers with more years experience have a lower perception of ability to perform as an industrial athletic trainer.

4) Certified Athletic Trainers earning only a Bachelor’s degree had a significantly higher perception of ability to perform as an industrial athletic trainer than those who earned an additional Master’s degree.

5) Certified Athletic Trainers with more experience in the industrial setting had a lower perception of
ability to work in the industrial setting than those with less experience.

6) Certified Athletic Trainers who took the accredited route to BOC certification had a significantly higher perception of ability to perform as an industrial athletic trainer than Certified Athletic Trainers who took the internship route.

Recommendations

Based on the results of this study, the following research recommendations were made.

1) Future studies should include only those who are actively working in the industrial or corporate setting, and not those working in the clinic.

2) Future studies should track the actual earned degree and compare significance between additional education in related and non related fields to athletic training.

3) Future studies should use only subjects that had additional certifications that pertained to working in the Corporate, Industrial, and Clinical settings.
REFERENCES


Appendix A

Review of Literature
Review of the Literature

This literature review will discuss the previous literature written regarding the development of this study: The perception of ability to perform as an industrial athletic trainer. This literature review is divided into three sections: 1) Job Market, 2) Occupational ATCs, and 3) The Industrial Athlete. A summary of the literature will be provided at the end of the literature review.

Job Market

When secondary school began looking for medical coverage of their sports in the early 1980s, they did not have trouble finding qualified people, but they did have trouble finding the funding to pay those people. Sometimes all they could afford was to have an Emergency Medical Technician (EMT) at the Friday night football game. The answer finally came when hospitals and clinics thought of a cost effective solution. If they began to hire the athletic trainers and then send them out to the schools, they would, in turn, send their injured athletes to the clinic for treatment. The clinic would then receive the
money from the insurance company and hopefully turn a profit.¹

Arnold et al² completed a study to emphasize which characteristics are important as an employee on a scale from one to four, of 35 items that are considered employee characteristics in the collegiate, high school, and clinical setting. Comparisons show that, in some cases, there were preferences among high school principals when it came to years of experience. They also would be more likely to hire an ATC if that person had a dual certification in athletic training and education. Apparently it is easier to get funding from a school district if a person can be employed as a teacher and an ATC.²

Besides working at the high school level, there are job opportunities working in athletics at the collegiate and the professional level. When it comes to highest ranked deciding factors for colleges hiring ATCs, they are as follows; BOC certification, bachelor’s degree, master’s degree, oral recommendations, and collegiate clinical experience, according to the study by Arnold et al.² Professional teams rely more strongly on years of experience and recommendations.
If the idea of working late nights and weekends does not appeal to all ATCs; there are other options. For a more structured approach to athletic training, there is the option of practicing as a physician extender (PE). Most often, the term physician extender is used to describe those practicing as physician’s assistants, mid-wives, and nurse practitioners. When practicing as a PE, an ATC can expect to take patients’ histories, perform rehabilitative exercises, and assist with casting and the fitting of braces and orthotics. They may also have some administrative responsibilities such as filing insurance forms, billing, referrals, and case management.

Not only is the PE option a bonus to the ATC, it is also a bonus to the physicians’ practice. Two case studies were done in clinics where ATCs were practicing as PEs. Results showed that there was improved patient satisfaction, an increase in generated revenue, and enhanced cost saving.

Another job opportunity that allows the ATC to avoid working late nights and weekends is working as an industrial athletic trainer. Working as an industrial athletic trainer is an up and coming profession that seems to be benefiting not only the employees, but also the employer. When it comes to getting people back to activity
as soon as possible, an ATC would be the most obvious of choices. Working in a profession where it is mandatory to have your patients physically active has brought forth some very innovative methods of prevention and treatment. One form of prevention that is most advantageous to the industry is job analysis. By completing a job analysis, the ATC is able to red flag any job responsibilities that may cause future injuries.\textsuperscript{3}

When newly graduated athletic training students are searching for jobs, what resources are available? Stilger et al\textsuperscript{5} surveyed undergraduate athletic training curriculum directors about different methods of helping undergraduates find job opportunities. Basic instruction on interview preparation, résumé building, and locating employment opportunities were just some of the items that were on the survey. The results show that minimal time, in most cases 15 minutes to an hour, were spent on counseling students to prepare for the job search.\textsuperscript{5}

Occupational ATCs

Before looking at the profession of athletic training, it is important to understand what movements occurred to make things the way they are today. It is important for
those who are not familiar with the professional setting of athletic trainers to note the difference between belonging to the National Athletic Trainers’ Association (NATA) and having the credential of ATC. It is possible to be an ATC without being a member of the NATA. It is noteworthy, though, that both settings have changed over time.

The first developments began in the 1950s. At this time, there was a desire to make those belonging to the profession acquire stronger credentials to enhance the overall profession of athletic training. Three years of work paid off when, in 1959, the educational program that was recommended by the NATA was approved by the Board of Directors.  

There were two very important features of this adopted curriculum which largely played into the employability of ATCs in the 50s and 60s. The first was the emphasis on obtaining a teachers certification as well as focusing on athletic training. Most often the area of study would be health or physical education. This was important due to the need for athletic trainers at the secondary school level. The second feature was that the prerequisite for acceptance into physical therapy schools was included in the curriculum. This may have been, in part, because William Newell, president of the NATA at the time of this
curriculum adoption, was both an ATC and a licensed physical therapist. 6

In the 1960s, it was evident that not too many colleges and universities were adopting the new curriculum. It seemed as though less than half of 1% of all colleges and universities in the United States knew about the proposed curriculum changes. That is when the Professional Education Committee took over. They worked to increase the awareness of athletic training matters in the professional and educational worlds. 6

There were four ways to be eligible for certification during this decade. Graduation from an NATA-approved athletic training education program, completion of an apprenticeship program, graduation from physical therapy school, and five years of active experience in athletic training were the four routes to certification. 6

From 1969 to 1982, the number of athletic training education programs increased from 4 to 62 in a total of 33 states, while nine graduate athletic training programs were formed. Sayers "Bud" Miller was crucial in implementing the next milestone in the field of athletic training, which was a declared major of athletic training being offered at colleges and universities. Although he passed away in 1981, he had proposed the concept of the athletic training
major, which would lead to a resolution being adopted by the NATA Board of Directors and implemented in all undergraduate athletic training education programs. In order to be considered an NATA approved program, there are certain guidelines and paperwork that need to be done. Due to all the confusion and timelines, there were many delays and, therefore, the proposed date in 1986 was pushed back to June 1, 1990. On this new date, two major features were required to be implemented. The first was a change in curriculum design. Instead of certain courses being offered, it was recommended that certain subject matter be covered. The second change was the need for competencies to be covered and tested in the educational programs.

The 1990s may have been the most crucial time for athletic training education programs. During this time, the idea of accreditation was the focus. Students who graduated from the internship route to certification were still able to sit for the NATA-BOC, but time would soon change that. There was an effort to unify the educational programs. This effort was first from the NATA, and then the American Medical Association’s commission on Allied Health Education and Accreditation (CAHEA). At this time, the Joint Review Committee on Educational Programs in
Athletic Training (JRC-AT) was established to oversee the accreditation process and standardize the guidelines for entry-level programs. Later, an independent agency known as the Commission on Accreditation of Allied Health Education Programs (CAAHEP) was adopted for the accreditation of all athletic training education programs. This happened after CAHEA was disbanded in 1994.\textsuperscript{7}

The main reason for CAAHEP accredited programs was to eliminate the doubt that there was a lack of education. Theoretically, the internship route offers less classroom education, but makes up for it in the clinical experience with the required 1500 hours. The accredited route offers more course work and information while decreasing the amount of clinical experience to 800 hours. It was, and still is, the job of CAAHEP to make sure that all education programs maintain certain standards and are able to offer the athletic training major.\textsuperscript{7}

With the focus of study changing from clinical application to classroom education, it is interesting to see if there is an affect on the amount of time spent in the clinical setting and the cumulative grade point average for an undergraduate athletic training student at an accredited program. A study was completed by Berry et al\textsuperscript{8} to examine how time was spent in the clinical setting. The
subjects were athletic training students in CAAHEP accredited athletic training education programs. A total of 177 students from 25 of the 131 institutions returned completed surveys. The following were options on how time was spent: instructional time, clinical time, unengaged time, managerial time, and waiting time. The average time spent in the clinical setting was 315 minutes. A Pearson correlation test was done to see if there was a significant relationship between grade point average and perceived time supervised by a clinical instructor or supervisor. Results showed that there was no relationship.  

January 1, 2004 was an important date in the accreditation movement. As of this date, no person graduating from a college that only had internship routes to certification would be eligible to sit for the BOC examination. There were a series of steps for an unaccredited program to follow in order to be eligible for accreditation. First, a self study would need to be completed, and then an on-site visit from members of CAAHEP would be arranged. During the on-site visit, it is important to note whether or not the program is complying with the standards and guidelines of the profession. After the on-site visit, a report is sent to the program director
and department chair from the JRC-AT to make them aware of any violations they may have committed.  

Peer and Rakich believe that, in order for there to be continuous improvement in the quality of athletic training education programs, it is important to treat the program more like a business. By monitoring the input and output and comparing actual results to expected results for educational programs, proper interventions can be made accordingly. Inputs would be considered student participation and quality of work, while outputs are the results of their work. This whole process involves the students, faculty and coursework. It is important to continually make sure that the necessary material is being covered in an acceptable and successful manner.  

Along with the primary education of ATCs, there is another very important form of education that must be completed in order to stay certified. Continuing education units (CEUs) must be earned, a total of 80 every three years. As the profession has changed over the years though, the trend has changed from having more service-based CEUs to more health care-based programs. The idea for CEUs rose from the idea that in order to be a professional it is important to stay continually educated on new trends and techniques in all aspects of health care.
At the time of this study, there were only five domains in the athletic training education program. At the current time there are six. Most often it is the idea to have CEUs that fall within one of the five domains of athletic training; 1) prevention of athletic injuries, 2) recognition, evaluation, and immediate care of athletic injuries, 3) rehabilitation and reconditioning of athletic injuries, 4) health care administration, and 5) professional development and responsibility. In a study by Cuppet, variables such as employment setting, years of experience, environment, employer support, age, education, professional isolation, and gender were evaluated as influences when deciding which domains were to be focused on. Gender was the leading variable that presented any type of relationship. Female ATCs indicated that there are greater needs for continuing education across most of the domains in the study.

Most of the time, the success of a continuing education program is most often based on attendance or overall satisfaction by those who attended. There is usually no test at the end. Therefore, by merely attending a conference, a health professional could be earning CEUs but not really be learning anything. By making the continuing education mandatory, there is a small violation
of voluntary education and this may not be the most ideal of conditions for adult learning styles.\textsuperscript{10}

There are certain factors that pertain to adult learning styles, although they are not based on age, but rather based on maturity level. It seems that the more mature the learner, the more they are able to learn something they can apply immediately. They are also more likely to learn something that applies to their social or professional life. The more mature the learner, the more self directed they become as well, allowing for experience as a learning tool. In order to effectively teach the mature learner, it is important to use some vital strategies; preparing an optimal learning environment, identifying learning needs, allowing the learner to set goals and organize their own learning, implement specific learning strategies, assess the extent of learning, and finally, to reflect.\textsuperscript{10}

It seems that the consensus shows most ATCs acquire their CEUs by attending the National Convention or other associated district and national meetings. But most of the time there is minimal material presented for educational purposes at these gatherings. In a study by Weidner,\textsuperscript{11} focus groups were formed to find out where the main focus of educational needs should lie. The groups consisted of
employed ATCs at the high school, college, corporate/industrial, professional, and clinical setting. The discussion concluded with the idea that there is a need for more non-conventional topics to be discussed, especially in the corporate/industrial setting. The learning style mostly agreed upon was a more comprehensive, less fragmented style. The sample size was small, so therefore, the test should only be considered preliminary.\textsuperscript{11}

Besides the small focus of CEUs being targeted towards the CIC athletic trainer, there is not really an educational focus for the different types of populations that those professionals work with. It is important to first understand what an athletic trainer’s role is in the modern work force. Recent information has focused on the idea that similar injuries can occur to a professional football player and a factory worker. Sometimes it may not be an acute injury but an overuse injury caused by repetitive motions, awkward posture, work/rest cycle, and excessive force. All of these behaviors can be monitored and changed accordingly by an ATC.\textsuperscript{12}

It has been observed that the same type of skills that an ATC uses to get an athlete back to immediate play in the sports arena may also prove beneficial for employees in the occupational setting. With an educational background
including biomechanics, exercise physiology and therapeutic exercise, an ATC is able to understand the biomechanics of an employee and use that knowledge to prevent injuries.\textsuperscript{13}

One company that has implemented and utilized an ATC is The Coca-Cola Company. Debbie MacLean, ATC, is the Health Operation Manager there. As an employee with The Coca-Cola Company, there are many opportunities for desired physical fitness, ranging from aerobic classes, to one on one exercise programs, and even to classes addressing ergonomics. The records from 1996 were reviewed and all treatments were observed to find out how much money the company saved by employing their own ATC instead of sending their employees out. Approximately $30,000 was saved in that year alone by administering treatments such as heat, ice, electrical stimulation, ultrasound, and rehabilitative exercises.\textsuperscript{14}

It is important to understand if there is a benefit or even a need for different types of treatments. Most of the time, there is a comparison between the before and after subjective patient ratings. This comparison is relied on to show if there is a value based on the treatment. There are three broad types of outcome that are significant when dealing with patients; clinical outcome, functional outcome, and patient satisfaction. All of these help to
illustrate the value of an ATC.\textsuperscript{15}

It is essential to continually review not only the treatment satisfaction, but also the case management as a whole. The main focus with case management is early detection and intervention with a focus on returning the employee to work as soon as possible. Since one of every three dollars of worker’s compensation is spent on musculoskeletal disorders, it is important to find ways to handle these cases more efficiently for the employee and the employer. Steps that have been identified include; implementing job-site analysis, developing better interaction between the employer and health care professionals, monitoring medical care, costs and results, and supporting the injured employee through frequent contact.\textsuperscript{16}

By becoming a key member in the relationship between the employer and the medical professionals, it is important that ATCs are willing to accept the role and challenge that management presents them. There are many roles that the ATC is responsible for taking on when working at the CIC setting. As well as being a medical provider, the ATC is also responsible for communicating with employers, both problems and also possible solutions. Marketing is crucial, for without any marketing, there would be no
reason to continue practicing. It is important to continue to draw in patients and clients with new and exciting opportunities. If there are multiple ATCs, it is important to designate one as the director so that there is one leader to make an impact on all the others, but it is also crucial to integrate the other members of the team, their input is vital as well.\textsuperscript{17}

With all the added responsibility of working in a non-traditional setting such as CIC, it would seem that there would be more negatives than positives to such a job. The NATA conducted a survey to find out who is currently working in the CIC setting and why they have chosen the job they have. The survey was emailed to over 6,000 NATA ATC members who reported working in the CIC setting. The leading reasons for choosing the CIC setting were salary (46.2%), work hours (35.4%), opportunity for job advancement (26.1%), job responsibilities (25.8%) and personal growth (24.7%). Most of the ATCs (43.3%) were satisfied with their positions, while 37% said that they saw themselves leaving in the next five years, but mostly to work in a different setting (36.9%).\textsuperscript{18}

Questions concerning their educational background proved that most of the undergraduate programs were satisfactory for educating them in emergency care, injury
documentation, communication, and rehabilitation, but lacked in areas of reimbursement, marketing, and sales.\textsuperscript{18}

Of those working in the CIC setting, there were improvements that they believe were vital not only for job satisfaction but also to improve the field in general. Some suggestions for improvement include: billing for services; educating others; starting private practices; participating in corporate health fairs; and publishing articles in newspapers, magazines and the web to discuss what has been done at the CIC setting to name a few.\textsuperscript{19}

The most staggering of statistics when it comes to discussion of ATCs working in the CIC setting is return on investment (ROI). A study that was done by the NATA in 2003 of companies that kept track of ROI showed nothing but positive results. Results stated that 100\% of the companies reported employing an ATC provided a positive return. Thirty percent indicated that the return was at least $7, while 80\% indicated more than $3. The number and severity of injuries also dropped considerably, 50\% and 94\% respectively.\textsuperscript{20}
Issues Affecting the Industrial Athlete

A fact that may not be known by the general public is that professional athletes are perceived as employees and covered under workers’ compensation in most jurisdictions. This means, that if they are injured during practice or a game, they are able to collect money for injuries, as long as they do not attempt to receive any other monetary settlement for torts from the team or any of the team’s employees.\(^{21}\)

One such case of an athlete suing his team was the case of Bayless v. Philadelphia National League (1979). Bayless was a pitcher for the Philadelphia Phillies who had sustained a back injury. As a result he was administered pain killers, but his dosage was too high. His pitching began to deteriorate and resulted in his release. Eventually he was confined to a mental institution due to his continual depression and diagnosis of paranoid schizophrenia. He initiated his lawsuit, which was later dismissed, on the premises that it all began with negligent administration of his pain medicine.\(^{21}\)

It may not be clear in the athletic setting how ATCs deal with workers’ compensation. It is very rare that you hear about injuries or monetary compensation for injuries
on ESPN. In the industrial setting though, it is a different story. Recently, there has been more interest in the matter of employee productivity and health status, not only by employers, but also by stockholders.²²

It is possible for workers to show up for work, but not be physically able to complete the tasks they are required to. Therefore, their productivity levels are decreased, and even though the company is not losing money by paying them to stay at home and recover from their injuries, they are still paying a person to complete a job that is not getting done. Monetary losses due to health care costs are easy to keep track of, but when it comes to reduced productivity, it is harder to calculate and record those losses.²²

The concern over direct costs of health care has shed further light on indirect costs. Direct costs consist of payments for diagnosis and treatment of injuries of employees. Indirect costs would consist of administrative expenses, lost productivity, cost of retraining a new employee, and absenteeism. Physical and emotional health play a large part in these indirect costs.²²

There are approximately 55 million working age individuals who suffer from chronic disabilities, or have some sort of impairment which makes them prone to
disability. Those disorders thought to have the largest effect on work disability are depression and mental disorder. Annually, there are over 234 billion dollars spent on chronic health conditions nationwide.\textsuperscript{22}

The research has been done and all results show that there needs to be a solution that is not only cost effective for the employer, but also beneficial to the employee. Instead of treating the patient well after the injury has occurred, today’s healthcare is more focused on prevention and early intervention. Athletic trainers have been a powerful resource in this battle of expenses and healthcare. One main reason is based on outcome assessment; a method of assessing how effective an intervention or treatment is.\textsuperscript{23}

The financial side of the situation presents the need for some sort of intervention, but the cause of all the expense is still very broad. The last statistical data that was available for observation was a study done by the Bureau of Labor Statistics in 1999. This study concluded that four out of every ten injuries resulting in time off of work were strains or sprains, involving predominantly the trunk. Of body parts that were more commonly injured, the back rated the highest, and the leading cause of injury was reported as overexertion.\textsuperscript{24}
Since the ATC specializes in the prevention, treatment and rehabilitation of injuries, it is obvious that there would be a suggested fit for an ATC in the occupational setting. In any setting, there is the fundamental idea of a team being present. In the athletic setting, the team may consist of the ATC, physical therapists, sports psychologists, nutritionists, coaches, and doctors. In the industrial setting, the team may be more focused towards business and less towards health. Typical members include ATCs, occupational therapists, nurses, risk managers, case managers, ergonomists, clinical psychologists, physicians and the workers.\textsuperscript{25}

It is not entirely up to the company or the ATC to make sure that the employee is fully preventing injuries. An employer can design their work stations to be ergonomically correct and make every medical accommodation available, but it is up to the employee to be in their personal best shape. Along with physical condition, it is the employee’s responsibility to work in a safe manner, incorporating proper mechanics and maintaining the correct posture.\textsuperscript{24,26}

In order to correctly assess a working station, a complete job analysis must be done. The goal of a job analysis is to provide information to the employer and the
worker on how they can create optimum productivity while still having a safe environment for the worker. It is recommended that all information pertaining to the job be collected prior to videotaping the employee. Pertinent information includes job duration, break times, list of job duties, dimension of the work station, protective equipment, and a list of tools that are used throughout the work day. The videotape would prove helpful in showing not only the ATC and employer possible hazards, but also show the worker what their posture is and how they can possibly change their biomechanics to prevent future injuries.\(^{27}\)

When examining the tape from a job analysis, there are some factors that are more necessary to look for than others. They include forceful exertions, awkward positions, local contact stress, vibrations, temperature extremes, and environmental nuisances. Forceful exertions include anything from a non-slip grip surface to an amount of weight that needs to be lifted. Awkward positions include mainly poor posture, but also any deviation from the normal which can be manually measured with a goniometer. Local contact stress includes any time the workers body is in direct contact with a hard surface or any sharp edges. Vibrations would simply be measured in amount of time they are in contact with any hand held
machinery that causes vibration. Temperature extremes would apply to those working outdoors or having any contact with machinery or parts that are of extreme temperature. Finally, environmental nuisances are based on the perception of the employee and need to be accompanied with a list of psychosocial and psychophysical factors of the job.\(^n\)

Not just anyone is able to set up and complete a job analysis. It is required that those interested in doing such work have at least a bachelor’s degree in any of the following pertinent fields: exercise science, athletic training, biomechanics, or a related field dealing with the core competencies. Credentials such as a Certified Ergonomics Associate (CEA) or a Certified Ergonomic Evaluation Specialist (CEES), would give more credibility to the client seeking services. A master’s degree in business, health or safety would also be an advantage.\(^n\)

By now, the job analysis is completed and the employer is given the results. It is important to implement the required changes, both to improve work productivity and the health of the employee. Programs that have had success in the past in getting injured workers back to work are called work conditioning programs. The work conditioning program is more than just an injury treatment; it is a
comprehensive treatment of the individual to make sure that they are prepared on all levels of exertion for a safe return to work. Like many other types of rehabilitation, the work conditioning is progressive with the minimum amount of visits being two hours, three times a week and a maximum of six hour visits, five times a week. During the visits, it is the responsibility of the work conditioning supervisor to emphasize abilities and not focus on the disability.28

Simply making resources available does not necessarily mean that the people who are more likely to need conditioning are going to volunteer themselves to participate. It is important to understand that when efforts were made in the past for wellness centers in the work force, only those who were already physically active utilized the new resources. Therefore, there was no real increase of productivity or decrease in workers’ compensation. However, today’s ideals have a totally different approach. It is a type of complete training for everyone in the work force. There is a large physical aspect, but along with that there is also nutrition education, motivational programs, and psychosocial sessions. It is true that over 80% of all medical costs are focused on the overweight and sedentary population.
Now with variety of programs and treatments, companies are likely to integrate this sort of overall health program. 29

One such case of a total implementation would be the Kennedy Space Center (KSC). In 1997, a RehabWorks clinic was designed to treat employees who were recovering from surgery to save time off work. This clinic then expanded to treat all injured workers, from working and non-working related injuries. If the injury was sustained at work, there was then a review of their work station, a mini job analysis, with reports being sent both to the healthcare and to the administrative ends. 30

If necessary, the employee will be referred to RehabWorks for treatment. Here, they not only receive modalities, but also an education about their injury and how to prevent it in the future. Home exercise plans are also given out, along with work conditioning that can be done at the fitness center, which is only steps away from the rehabilitation facility. There are also monthly meetings to discuss any changes in work stations, workers’ compensation cases, and to discuss workers progression through rehabilitation. Since the inception of this program, over 4,000 employees have benefited, and the company has saved over $1.4 million. 30
Summary

Anyone working as a Certified Athletic Trainer, or even in a profession that works directly with ATCs, understands that there is a general consensus that the working hours are not desirable. There is always a concern over late nights and working weekends. The new trend of working in the corporate or industrial setting is the option of working a strict nine to five job without the hassle of weekends.

Along with the convenience of working “normal” hours, there is also the responsibility of working with people that are not prone to being in peak physical condition. Although the ATC is required to complete four years of education at an accredited institution, and pass the BOC exam, the education is still focused towards dealing with an athletic population.

It is suggested that when working in the corporate or industrial setting that additional certifications would make an applicant seem more credible. Specifically, credentials such as a Certified Ergonomics Associate (CEA) and Certified Ergonomic Evaluation Specialist (CEES) are certifications that may make the ATC more marketable in the industrial setting. These additional certifications make it possible to successfully complete job analysis and make
sure the company is taking all necessary precautions when it comes to workers' safety.
Appendix B

The Problem
Statement of the Problem

The primary focus of this study was to determine if the Certified Athletic Trainer has been sufficiently educated to cover the wide scope of occupational settings including the industrial setting. Traditionally certified athletic trainers work with the young and active population, and athletic training educational programs focus their curricula toward having ATCs working with that type of population, as opposed to working with members of the industrial setting. This study examined if the accredited programs were sufficient enough in teaching future certified athletic trainers for all the variety of work places.

Definition of Terms

To better understand this study, it is necessary to define the key terms that will be used. The following terms have been given operational definitions as they pertain to this study:

1) Ergonomics: adapting a workstation to an individual rather than having a uniform workstation and making the individuals conform to it.¹⁴
2) Industrial Athlete: employees working in the CIC setting that are prone to the same type of acute and overuse injuries that people in the athletic arena are also susceptible to.

3) Industrial Athletic Trainer: a Certified Athletic Trainer working in the industrial or corporate setting, in which their job description is based on injury assessment, treatment, rehabilitation, and preventative measures.\(^\text{12}\)

4) Job Site Analysis: a series of observations and research which allows the employer to see how much time is spent in different contacts and positions while performing the desired task.\(^\text{27}\)

5) Perception of Ability: a system of measurement that is used for individuals to decide how competent they are at performing in the industrial setting.

6) Physician Extender: refers to any medical practitioner; including but not limited to physician’s assistants, nurse practitioners, and athletic trainers, working under the direct supervision of a licensed physician.\(^3\)
Basic Assumptions

The following are the basic assumptions for this particular study:

1) All subjects surveyed answered the questionnaire honestly and to the best of their ability without fear of having their results reported since the survey was anonymous.

2) The subjects are knowledgeable about their profession, as working in the corporate, industrial, clinical setting.

3) All subjects participating have at least the equivalency of a Bachelor’s degree in Athletic Training, or have completed the course work necessary to sit for the BOC.

4) The questionnaire will have content validity after review of the panel of experts.

Limitation of the Study

The following is a possible limitation to the study:

1) The study was limited to ATCs who specified working in the CIC setting on their NATA membership.

2) The percentage of return may be lower than 40%.
Significance of the Study

Beginning in the year 2004, all athletic training educational curricula must be accredited by the Commission on the Accreditation of Allied Health Education Programs (CAAHEP). Previous to this mandate, it was possible to sit for the certification test by the internship route, which consists of more clinical hours but supposedly less classroom education. In any curriculum though, it is the idea to teach the student to work with athletes, which are healthy individuals who will be compliant to recommendations for rehabilitation.

Now, there is an increase in alternative occupations for athletic training. One of the expanding fields is in the industrial setting. There have been many studies that have shown that it is economically beneficial to keep a Certified Athletic Trainer on staff to treat injured workers. The employer not only saves money due to lost productivity from missing employees, since the employee would still come to the workplace to receive treatment, but the employees would also be more likely to do their jobs well and without complaint while producing more product.
With the ever expanding job market, the education should also be changing. It has been suggested that most acute injuries in the work place occur the same way they would on a football field or basketball court. Overuse injuries may also be brought on by the same type of motions that a baseball player or a runner use. But there may be underlying problems in the older population, and they may not be as motivated to begin a strict regimen of rehabilitation. Additional certifications and training may be necessary in order to effectively treat those in the industrial setting.

By surveying the Certified Athletic Trainers, I hope to find out what type of education they received, and what they think would prove most beneficial to prepare future Certified Athletic Trainers for that type of occupational setting. Age range may prove to be a significant factor, seeing that a considerable percentage of older certified athletic trainers may have graduated from internship route institutions. By asking questions addressing different types of educational training, there may be suggestions for a more complete form of curriculum to train a more qualified Certified Athletic Trainer.
Appendix C

Additional Methods
Appendix C1

Panel of Experts Letter
Dear Expert,

I am a graduate student at California University of Pennsylvania pursuing a Master of Science Degree in Athletic Training. To fulfill the thesis requirement for this program, I am conducting a descriptive study. The objective of this study is to assess the perception of a certified athletic trainers' ability to perform in the industrial setting.

In order for this questionnaire to be a valid instrument, a panel of experts has been chosen for the review. You have been selected as one of the three industrial athletic training experts to be on this panel. Due to your position and experience, your feedback is very important for the success of this study. The information obtained by this panel of experts review will be used to make revisions and create the final questionnaire to be utilized in this study.

Please answer the following questions based on the attached questionnaire and make any additional comments you believe are appropriate. Please return your comments to me by returning this document. Please feel free to contact me if you have any questions at:

Home: (724)-938-2533
E-mail: dil2756@cup.edu

1) Are the questions appropriate, valid and understandable?

2) Comment on the overall presentation of the survey.

3) Which questions, if any, should be excluded from the questionnaire?

4) Which questions, if any, should be added to the questionnaire?

Thank you in advance for your time and efforts in this matter.

Sincerely,
Laura Dillaman, ATC
California University of PA
Appendix C2

Competence of an Industrial Athletic Trainer Questionnaire
Competence of an Industrial Athletic Trainer Questionnaire

SECTION ONE: DEMOGRAPHICS

Please complete this section by selecting the correct response or by typing in the correct response in the space provided.

1) Male______ Female______

2) Age_______

3) How many years of experience do you have as an ATC? ________________________

4) How many years of experience do you have in the industrial setting? ________________________

5) What was your route to BOC certification?
   Accredited_____ Internship_____ 

6) Select all of the following certifications that you currently hold.
   _____Cardiopulmonary Resuscitation (CPR)
   _____Automated External Defibrillation (AED)
   _____First Aid
   _____Emergency Medical Technician (EMT)
   _____Certified Ergonomic Evaluation Specialist (CEES)
   _____Certified Ergonomics Associate (CEA)
   _____Certification in Industrial Ergonomics (CIE)
   _____Certified Functional Capacity Evaluator (CFCE)
   _____Certified Work Capacity Evaluator (CWCE)
   _____Other____________________________________________

7) Please check off all degrees earned and list your major:
   _____Bachelor’s___________________________________________
   _____Master’s____________________________________________
   _____Doctorate___________________________________________

8) Please check off all your employment settings and list the number of years in that setting.
   Setting Number of Years
   _____Clinic
   _____Clinic/Industrial
   _____Corporate
   _____Government


SECTION TWO: PERCEPTION OF ABILITY

The following items have been chosen based on criterion listed by different employers, and the input from a panel of experts. To complete this section, please list your own competence level dealing with the following items. Please remember this is an individually based perception of ability questionnaire, in no way should your answers reflect the ability of all ATCs in the industrial setting.

The following numbers directly relate to the level of competence you feel about the following items. A level 5 response would mean that your educational background and years of experience allow you to complete the action in a knowledgeable and easy manner. A level of 4 means that you are able to complete the action, but not to the degree of certainty of a level 5. A level 3 would mean that you are able to complete the task, but with the help of texts or other professionals. A level 2 would mean that you have not even heard of the task, but you have the resources available to complete it. And finally a level 1 would mean that you have no idea how to complete the task and do not know if you have the resources available to do it.

5 - Very Competent
4 - Competent
3 - Moderately Competent
2 - Minimally Competent
1 - Not Competent

1) _____Budgeting
2) _____Cost justification
3) _____OSHA compliance
4) _____OSHA reporting
5) _____Written reports (monthly, quarterly, annually)
6) _____Communication skills with management
7) _____Communication skills with employees
8) _____Relationship building
9) _____Explaining insurance benefits to patients
10) _____Reimbursement documentation
11) _____Verifying insurance
12) _____First Aid when dealing with severe on-site injuries
13) _____Development of safety training programs
14) _____Improvement of safety awareness
15) _____Prevention of workplace and non workplace injuries
16) _____Prevention of injuries through job site coaching
17) _____Prevention of injuries through job site evaluation
18) _____Prevention of injuries through newsletters
19) _____Prevention of injuries through health fairs
20) _____Work hardening
21) _____Work conditioning
22) _____Ergonomic evaluations
23) _____Functional capacity analysis
24) _____Implementation of the work-fit musculoskeletal disorder management program
25) _____Health and wellness programming
26) _____Job site analysis
27) _____Fitting and proper use of orthopedic products
28) _____Patient education for durable medical equipment
Appendix C3

Institutional Review Board
California University of Pennsylvania

PROTOCOL for Research Involving Human Subjects

Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects

☐ Request for Exempt Review
☐ Request for Expedited Review
☐ Request for Full Board Review

(Reference IRB Policies and Procedures for clarification)

Project Title: Perception of the Certified Athletic Trainer’s Ability to Perform in the Industrial Setting

Researcher/Project Director: Laura Dillaman

Phone #: (724)-938-3182  E-mail Address: dil2756@cup.edu

Faculty Sponsor (if you are a student): Dr. William Biddington

Department: Health Sciences and Sport Studies

Project Dates: January 2005 to March 2005

Sponsoring Agent (if applicable):

Project to be Conducted at California University of Pennsylvania

Purpose of the Project: ☑ Thesis ☐ Class Project ☐ Research ☐ Other

Required IRB Training

The training requirement can be satisfied by completing the online training session at http://cme.ncl.nih.gov/. A copy of your certification of training must be attached to this IRB Protocol. If you have completed the training at an earlier date and have already provided documentation to the California University of Pennsylvania Grants Office, please provide the following:

Previous Project Title:

Date of Previous IRB Protocol:
(All Proposals Must be Typed)

1. Give a brief overview of your project/proposal with research hypothesis.

I am planning on surveying all of the athletic trainers working in the Corporate/Industrial/Clinical (CIC) setting to find out if they believe there is a greater need for an industrial based athletic training education program. The following variables will be assessed in the first section of the survey: gender, age, years of experience, type of undergraduate education, types of certifications, and current employment. The second part of the survey will deal with their perception of ability to perform different tasks that are listed as job descriptions by several employers when searching for industrial athletic trainers. Perception will be based on a likert scale, with the total amount of points ranging from 28 to 140. The following are the research hypotheses: There will be a negative relationship between the age of the athletic trainer and the perception of their ability to perform as an industrial athletic trainer, there will be no difference between genders for their perception to perform as an industrial athletic trainer, there will be a positive relationship between number of years certified and perception of ability to perform as an industrial athletic trainer, and certified athletic trainers with additional education will have a higher perception of ability to perform as an industrial athletic trainer as compared to those without additional education.

2. Give a brief description of the subjects you plan to use, and check the appropriate box(es) below.

Subjects for this study will include certified athletic trainers who are members of the National Athletic Trainers’ Association (NATA) and working in the CIC setting as described by their membership to the NATA.

☐ Adult Volunteers
☐ Minor Volunteers
☐ Children Under 18
☐ CAL University Students
☐ Minorities
☐ Disadvantaged
☐ Mentally Ill
☐ Elderly
☐ Mentally Retarded
☐ Physically Handicapped
☐ Prisoners
☐ Pregnant Women

3. Is remuneration involved in your project? ☐ Yes or ☒ No

If yes, Explain below.


Selection of subjects will be based on their participation in the NATA. All of the members listed in the CIC Athletic Training listserv will be contacted about participating in this study. It will be volunteered based and their participation is requested but not required.

5. Does your project involve use of a consent form? ☐ Yes or ☒ No

If yes, attach the form.

Consent is implied based on the fact that they will complete and return the survey, since the study is online.

6. What instruments or devices will be used to gather data? Provide a copy of documentation pertaining to the data collection, such as but not limited to:

Cover letter, questionnaire/survey, consent form, interview/focus group sheets.

Participants will be receiving a cover letter and a link to the survey. Completed surveys will be sent back to the researcher anonymously.

7. Is this project part of a grant? ☐ Yes or ☒ No

If yes, provide the following information:

Title of the Grant Proposal ____________________________
Name of the Funding Agency ________________________________

Dates of the Project Period ________________________________

8. Does your project involve the debriefing of those who participated? □ Yes or □ No
   If yes, explain the debriefing procedure.

9. The Federal Regulations require that the protocol meet certain criteria before IRB approval can be obtained. Describe in detail how the following requirements will be satisfied:

   A. Insure that the risks of the subject are minimized.

      There is no risk involved to any subject, they are completing the survey to the best of their ability and submitting it anonymously.

   B. Justify the degree of risk involved (if any) in relationship to the potential of the project to the subject matter.

      There is no risk involved.

   C. Insure that the selection of the subjects is equitable.

      I am planning on doing a national survey which will include all NATA members in the CIC setting.

   D. Guarantee that informed consent will be obtained for each prospective subject or the subject's legally authorized representative and that consent forms will be adequately documented.

      Informed consent will be implied by the subject completing and returning the survey. This statement is also in the cover letter that will accompany the survey via the internet.

   E. Monitor the data collected to ensure the safety of the subject.

      I will be using a listserv as supplied by the NATA, and therefore, all data will be turned into anonymous data by the time it reaches me electronically.

   F. Protect the privacy of subjects and maintain the confidentiality of data.

      All surveys that are completed and return will be stripped of any personal identifying data, only demographic information and their likert scale responses will be used.

   G. Provide for extra safeguards to protect the rights and welfare of “vulnerable” subjects (e.g., children, prisoners, pregnant women, mentally disabled persons or economically or educationally disadvantaged persons).

   **Project Director’s Certification**

   Program Involving HUMAN SUBJECTS

   The proposed investigation (research or training program) involves the use of human subjects and I am submitting the complete application form and description of the project to the Institutional Review Board for Research Involving Human Subjects.

   If the Board grants approval of this application, I agree to:

   1. Abide by any conditions or changes in the project required by the Board.
   2. Report to the Board any change in the research plan that affects the method of using human subjects before such change is instituted.
   3. Report to the Board any problems that arise in connection with the use of human subjects.
   4. Seek advise of the Board whenever I believe such advice is necessary would be helpful.
   5. Secure the informed, written consent of all human subjects participating in the project.
6. Cooperate with the Board designed in its effort to provide a continuing review after investigations have been initiated.

I have reviewed the Federal and State regulations concerning the use of human subjects in research and training programs and the guidelines. I agree to abide by the regulations and guidelines aforementioned and will adhere to policies and procedures described in my application. I understand that changes to the research must be approved by the IRB before they are implemented.

**Professional Research**

Signature of Project Director

Signature of Department Chairperson

**Student Research**

Signature of Student Researcher

Signature of Faculty Member

Signature of Department Chairperson

* * * * * * * *

**ACTION OF REVIEW BOARD**

The Institutional Review Board for Research Involving Human Subjects has reviewed this application to ascertain whether or not the proposed project:

1. provides adequate safeguards of the rights and welfare of human subjects involved in the investigations;
2. uses appropriate methods to obtain informed, written consent;
3. indicates that the potential benefits of the investigation substantially outweigh the risk involved.
4. provides adequate debriefing of human participants.
5. provides adequate follow-up services to participants who may have incurred physical, mental, or emotional harm.

**BOARD DISPOSITION:**

Chairperson, Institutional Review Board

Date
Appendix C4

Cover Letter
Dear Fellow Certified Athletic Trainer:

I am a master’s degree candidate at California University of Pennsylvania, requesting your help to complete part of my degree requirements. Please follow the link at the end of this letter to an online survey titled: Competence of an Industrial Athletic Trainer Questionnaire.

The questionnaire consists of seven demographic questions and twenty eight Likert Scale (1 not competent to 5 very competent) questions, which will take about five to seven minutes to complete.

Seven hundred and seventy-nine certified NATA members working in the CIC setting with a listed email address are being asked to submit this questionnaire, but you have the right to choose not to participate. The California University of Pennsylvania Institutional Review Board has approved this study for the Protection of Human Subjects.

This is a completely anonymous questionnaire and upon submission, neither your name nor email address will be attached to your answers. Your information will be kept strictly confidential.

As a fellow certified athletic trainer, your knowledge and opinions regarding this topic makes your input invaluable. Please take a few minutes to fill out the anonymous questionnaire you will find by clicking on this link and submit it within 3-7 days:

(http://webpagelink/)

Thank you for your time and consideration.

Sincerely,

Laura Dillaman, ATC
California University of Pennsylvania
253 California Rd Apt. 1025
Brownsville, PA 15417
dil2756@cup.edu
REFERENCES

1. Finkam S. To reach out or not: that is the question. Athletic Therapy Today. 2003;8:38-39.


ABSTRACT

TITLE: PERCEPTION OF CERTIFIED ATHLETIC TRAINER’S ABILITY TO PERFORM IN THE INDUSTRIAL SETTING

RESEARCHER: Laura R. Dillaman

ADVISOR: Dr. William B. Biddington

PURPOSE: The purpose of this study was to examine the Certified Athletic Trainer’s ability to perform in the industrial setting.

METHODS: There were 779 Certified Athletic Trainers that indicated working in the Corporate, Industrial, or Clinical setting through the NATA. Of these 779, 123 responded with completed surveys. The questionnaire consisted of 8 demographic questions and the Competence of an Industrial Athletic Trainer Questionnaire. The Competence Questionnaire consisted of 28 questions to measure perception of ability.

FINDINGS: Four hypotheses were tested to determine differences and relationships between Likert scale scores and different variables. Additional findings were also discovered. There was significance for age, years of experience and additional education for the Certified Athletic Trainer’s perception of ability, and no significance between genders. Significant differences were also found for perception of ability to work in the industrial setting when comparing years of experience in the industrial setting and route to BOC certification.

CONCLUSIONS: Younger certified athletic trainers, those who have less experience in the industrial setting and those who took the accredited route to BOC certification feel more competent working in the industrial setting than older certified athletic trainers, those who have less experience in the industrial setting and those who took the internship route to BOC certification.