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Athletic Training Instructors: A Needs Assessment of Teaching Methodology Knowledge and Self-Perceived Competence

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Objective: The objectives were to assess teaching backgrounds, self-perceived teaching methodology knowledge, and self-perceived competence of Athletic Training Education Program (ATEP) instructors to determine if there was a need for more instruction in teaching methodology (TM).
Design & Setting: This was a quantitative design utilizing a discrepancy needs assessment model. A web-based survey was used to gather data. This was a total population study with no sampling.
Subjects: The population studied was Certified Athletic Trainers (ATCs) in the United States who had obtained a master's degree and were working in a college/university setting. The instrument further defined the study population to those who were currently teaching (study conducted in Fall 2002) in approved or accredited ATEPs (N=149).
Measurements: The items measured were each participant's educational and instructional background, their knowledge of 20 TM components, their self-perceived competence on those same 20 TM components, and their likelihood of pursuing future TM instruction.
Results: Participants with lower gap scores generally had less previous instruction in TM, lower knowledge scores, and were less likely to pursue future instruction in TM. Neither amount of previous instruction in TM nor how long the participants had been teaching significantly influenced self-perceived competence scores. Taking an undergraduate TM course and the use of structured mentoring significantly predicted self-perceived competence scores.
Conclusions: This study illustrates the need for more TM instruction to be included in the preparation of ATCs with master's degrees who have or will have teaching responsibilities associated with their jobs. It would be prudent for athletic training graduate degree programs to include TM instruction in their curriculums and/or fieldwork. There is also support for the pursuit of a M.Ed. degree for students who wish to teach in the future.
Key Words: pedagogy, teacher effectiveness, teaching skills, teacher training, education, instruction

In 1998, there were 82 accredited undergraduate programs.[1] As of April 2002, there were 165[2], and 273 in July 2004.[3] Each of these programs employed certified athletic trainers with a master's degree assigned teaching responsibilities. With this expanding number of programs, there is and will likely continue to be an increasing demand for athletic training instructors. Therefore, an increased emphasis on teaching methodology knowledge should be included in graduate curriculums to prepare students for this increasing job responsibility demand. Yet, at the time of this study, only one master's degree program of the 13 in the nation provided for teaching methodology (TM) instruction in its curriculum, albeit as an elective.

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Not only do Athletic Training Education Program (ATEP) instructors need to be knowledge experts in the field of athletic training, they must also be able to effectively teach that knowledge. With the wealth of knowledge available around learning styles, brain-based learning, and teacher effectiveness, it would be prudent for instructors of undergraduate students to possess a basic understanding of the information concerning these issues. Though an athletic trainer may be exceptional in one of the three components of clinical practice, research, or teaching, it does not necessarily follow that they are exceptional in the other two. Through the Graduate Standards and Guidelines, competency in clinical and research skills is required. Competency in teaching is not listed and at best, an option.[4]

The NATA Career Center web-site was visited (April 2002) to provide a general overview of the status of athletic training jobs requiring teaching experience. A search of "College: staff/faculty full-time" listings was performed (not including GA positions). There were a total of 72 postings (Table 1).

Some interesting aspects illustrated by this table are worth noting. Some jobs require the employee to teach, but do not require any teaching experience. Nearly half (45.8%) of the jobs posted had teaching responsibilities associated with the job. Of the jobs

Table 1. NATA Career Center Postings for College Staff/Faculty Full-Time[5]

Job Description	Number of Jobs	Percentage of Jobs
Require ATC only	20	27.8
Require master's degree; no teaching experience; no teaching responsibilities with job	12	16.7
Require master's degree; no teaching experience; teaching responsibilities with job	15	20.8
Require master's degree; teaching experience; teaching responsibilities with job	18	25.0
Require PhD	7	9.7
Total Postings	**72**	**100.0**
Total requiring master's degree	**45**	**62.5**
Total requiring teaching responsibilities with job	**33**	**45.8**

requiring a master's degree, 73.3% of those (33 out of 45) had teaching responsibilities associated with the job. One-quarter of the jobs in the college setting (where accredited undergraduate programs are housed) require an ATC with a master's degree with teaching experience *and* require teaching responsibilities with the job. This review of the NATA Career Center listings illustrates the demand for athletic trainers with master's degrees to fill jobs requiring teaching responsibilities. With roughly 73% of the available jobs for this population having teaching responsibilities associated with the job, this snapshot illustrates the need to assess the teaching competency of ATCs with master's degrees who will fill these jobs.

A follow-up search of the NATA Career Center was completed in March of 2006. This found 32 postings for "College – Academic/Educational and Dual Appointment" jobs, and 35 postings for "College – Professional Staff/Athletics/Clinic" jobs. These results indicate that nearly 48% of the job postings currently are for academic positions requiring teaching.

With teaching knowledge and experience theoretically becoming more in demand with the increase in numbers of ATEPs, one must ask the question are we preparing our graduate level ATCs well enough to excel within this job responsibility? ATEPs across the country differ greatly in the number and educational degrees of their faculty. Some programs employ only two instructors with master's degrees and dual appointments in athletics, while other programs employ four or more full-time tenure track faculty, among others. It was unknown how many of these faculty members have any background in pedagogy/teaching methodology. The author's working definition of pedagogical knowledge is the knowledge of teaching strategies and methodologies used to foster student learning. The creation of several pedagogy knowledge base frameworks has resulted in wide-spread efforts to define what this pedagogical knowledge base should include. To aid in conceptualizing these different frameworks, a table was created (Table 2). This table was used to construct Part 2 of the survey.

Currently, there have been no documented research efforts to assess the level of teaching knowledge held by ATCs with master's degrees who are responsible for educating within ATEPs. This study illustrated the state of self-perceived teaching knowledge held, the self-perceived teaching competence, and assessed the need for more formal teaching methods instruction. This study was performed in an effort to improve the educational experiences of all students in athletic training educational programs at all levels.

Research questions investigated were:

1. What is the relationship between the scores of participants' knowledge of TM and self-perceived teaching competence?
2. How do participants that have had instruction in TM and those who have not compare on knowledge of TM?
3. How do participants that have received none, some and much instruction in TM compare on the gap score created by their knowledge of TM and their self-perceived competence?
4. How do participants' likelihood of taking a TM seminar compare on gap scores?
5. Is there a combination of the eight types of instruction in TM that participants may have gained their competency in (course in undergraduate program, course in graduate program, GTA, professional development seminar, structured mentoring, athletic training content knowledge, experience on the job, observing others) that predicts their self-perceived competence level better than any one type of instruction alone?

Methods

This study investigated the level of self-perceived TM knowledge and competence held by current instructors in athletic training education programs nationally, assessed the need for further instruction in TM from the perspective of the instructor, and suggested recommendations to provide for the identified needs. This was a total population study with no sampling. Prior to study administration, Internal Review Board approval was obtained at Colorado State University.

Participants

All certified members of the NATA who possessed a master's degree and were working in the college/university setting were surveyed via an electronic, web-based survey (N=2644). The NATA granted permission to use and provided the participant e-mail list for this survey. The NATA database could not distinguish who was teaching and who was not. Therefore, the narrowest list the NATA could provide was of certified members with their master's degrees working in the college/university setting. The survey then asked who of the population identified was currently teaching. All responses to the survey were analyzed, whether currently teaching or not, for background data to inform the NATA membership what percentage of ATCs with master's degrees in college settings were currently teaching.

Table 2. Comparison of Components of Pedagogical Knowledge from Five Frameworks

Knowledge Area	Johnson[6]	Nilson[7]	Clymer[8]	Pregent[9]	Miller & Miller[10]
Determine objectives	●	●	●	●	●
Syllabus development	●	●		●	●
Classroom management	●	●			
Classroom environment	●	●	●	●	
Student learning styles	●	●	●	●	●
Teaching methods	●	●	●	●	●
Cognitive, affective, and psychomotor domains	●	●		●	●
Effective lectures	●	●		●	●
Discussion techniques	●	●		●	●
Cooperative learning	●	●		●	●
Alternative teaching methods	●	●	●	●	●
Student evaluation & grading	●	●	●	●	●
Term papers/oral presentations	●	●			
Adult learning principles			●		
Teaching styles			●		
Technology tools		●		●	●
Copyright laws		●			
Motivating students		●			

Procedures

The survey instrument was administered via an electronic on-line site. Each participant received an electronic mail message stating the scope of the research project, inviting them to participate, and directing them to the survey web site. Once the participant finished and submitted the survey, it was returned as an anonymous e-mail message. A reminder e-mail message was sent one week later to help increase the response rate. To ensure anonymity of the participants, each return message address line recorded the "sent from:" as "respondent", with no names, institutions, or any other identifiers. By utilizing a linked site, no return electronic addresses were included with the participants' response, thus assuring anonymity and confidentiality. Lastly, the cover letter stated that by returning the survey, the participant was giving informed consent to participate in the study.

Survey instrument

A review of the literature revealed no one instrument that measured both knowledge of TM and perceived teaching competence. Therefore, the instrument was created and designed by the researcher. The format of the instrument was established per recommendations by Salant and Dillman.[11] The literature review provided the 20 TM components used in Part 2 of the survey. The 20 TM components were measured separately for the participant's knowledge of each component and for their self-perceived competence in utilizing each component. The instrument had three sections:

Part 1: Background Information – 16 questions designed to address the general educational background information of each participant and information in regard to preparation to teach;

Part 2: Assessment of Teaching Knowledge and Self-Perceived Teaching Competence – measured both knowledge and self-perceived competence on 20 TM components utilizing a 5-point Likert scale;

Part 3: Comments and Feedback – allowed for comments from the participant about the study to be submitted to the researcher.

Once the instrument was on-line, a pilot test was performed. The instrument was delivered as a link in a cover letter to a representative sample (n=21) of ATCs with master's degrees who were teaching in ATEPs, as selected by the researcher. The participants were directed to the website and requested to use the "Comments", Part 3 section of the survey to evaluate the whole system, the face validity of the instrument, the format of the survey and of the response choices, the ease of completing the survey, the length of time it took to complete the survey, and any unclear or confusing parts. Upon return of the pilot tests, reliability measures revealed a score of 0.95 (Cronbach's alpha) for the knowledge measure and 0.87 for the perceived competence measure.

Instrument validity was established through three methods: 1) face validity using the pilot study participant responses; 2) content validity; and, 3) construct validity using factor analysis. Each of the pilot study participants responded positively to confirm face validity. Content validity was established by sending the instrument to four tenured professors in the School of Education at Colorado State University for evaluation. Each expert responded very positively to confirm content validity, particularly of Part 2 of the survey. A factor analysis created a rotated component matrix of the competence measure grouping the initial 22 TM components into five groups. The rotated component matrix of the knowledge measure created 5 groups also, though the groupings were different. For the final instrument, four groups were created that most closely preserved the groupings suggested by each separate factor analysis.

Two TM components of the original 22 were dropped from Part 2 after a factor analysis showed little correlation. The component of *giving students feedback* had negative correlations with both the competence measure (-0.819) and the knowledge measure (-0.191). The component of *use of cooperative learning*

had low correlation on the competence measure (0.405) and a very low correlation on the knowledge measure (0.274). Thus, both components were dropped from the final instrument. Comments from the pilot study participants indicated that the response choices provided were appropriate and thorough. Information gained from the pilot test was used to refine the final instrument.

Results

The survey was sent to 2701 participants who fit the description (as registered with the NATA membership database) of being certified, possessing at least a master's degree, and working in a college/university setting. It was not possible to identify those within that population who were teaching, per the NATA database. Assessing the response rate, then, was difficult. Of the 2701 initial contact letters sent, 57 were returned as "system error" or "undeliverable" with the electronic mail addresses used. This left a total of 2644 surveys successfully sent. There were 341 responses to the survey. This yielded a response rate of 12.9%, which was a dramatically low response rate. This was perhaps unacceptable by many standards. However, due to the nature of the cover letter, stating the purpose of the research was to assess teaching information of athletic training instructors in approved or accredited ATEPs, those who were not teaching may *not* have felt compelled to respond to the survey.

Of the 341 participants, 149 (43.7%) reported that they were currently teaching in a NATA approved or CAAHEP accredited program. 140 of the 149 participants currently teaching reported teaching in the classroom, while 124 reported teaching in the clinic. It was not established how many taught in both settings. Those who were not teaching completed the first six questions of the survey and were then directed to the comments section at the end of the survey, skipping Part II. Those who were teaching completed all three Parts of the survey. The data were checked for outliers before statistical analysis began. The mean number of years teaching in an ATEP program was 7.9 years. The mean percentage of job responsibilities dedicated to teaching was 47.0%.

Part 2 of the survey consisted of participants rating themselves on 20 TM components for both their knowledge of the component and their self-perceived competence in utilizing the component. Measurement reliability was assessed for both the knowledge scale and the self-perceived competence scale. Reliability was high for both scales using Cronbach's alpha (knowledge = 0.92; competence = 0.91), which indicated a high level of internal consistency and interitem reliability.

There were four indices created to assist in data reduction and analysis: a knowledge index (KI), a self-perceived competence index (CI), a gap score index (GSI; difference between knowledge and competence scores), and an amount of previous formal instruction in TM index (PII). For the latter index, those participants who had <u>*no*</u> previous instruction were coded as a 2 (none group); those who had instruction either before <u>*or*</u> after receiving their graduate degree were coded as a 3 (some group); and those who had instruction in TM <u>*both*</u> before and after receiving their graduate degree were coded as a 4 (much group). Descriptive statistics were run on all four indices (Table 3).

Research question one used a Pearson correlation to investigate the relationship between the scores on the KI and CI. The results were statistically significant, r 149) = .875, $p < .001$. This indicated that generally, participants who scored themselves highly on knowledge of TM components also scored themselves highly on self-perceived competence of those TM components. The effect size, $r^2 = .77$, was a large effect size.[12]

Table 3. Means and Standard Deviations of Indices of Knowledge Scores, Self-Perceived Competence Scores, Gap Scores, and Previous Instruction in Teaching Methodology Scores

Index	N	M	SD
Knowledge (KI)[a]	149	3.91	0.59
Competence (CI)[a]	149	3.74	0.57
Gap (GSI)[a]	149	0.17	0.29
Previous Instruction (PII)[b]	146	3.37	0.69

[a] based on scale of: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent

[b] based on scale of: 2=no instruction, 3=some instruction, 4=much instruction

Research question two used a one-way ANOVA to determine how ATCs with master's degrees that had previous instruction in TM and those who had not compared on knowledge of TM. The results were statistically significant, $F_{2,140} = 4.6$, $p = .01$.

To discern where the difference was, a Tukey Honestly Significant Difference (HSD) post-hoc test was performed. The results revealed only one significantly different pair of means ($p = .01$), between the group with no instruction in TM (M = 3.61) and the group with much instruction in TM (M = 4.03). The effect size (d = 0.309) was a low to medium effect size.[12] This indicated that the participants with more instruction in TM, when compared with those with no previous instruction, had significantly more self-perceived knowledge of TM. Conversely, those with no previous instruction perceived themselves as having less knowledge.

Research question three investigated how ATCs with master's degrees who had received none, some and much previous instruction in TM compared on the GSI. A one-way ANOVA was used. The results were statistically significant, $F_{2,138} = 9.2$, $p < .001$. This indicated that there was a difference somewhere between the mean gap scores for the three levels of how much previous instruction in TM the participants possessed. To discern where the differences were, a Tukey HSD post-hoc test was performed.

The results of the post-hoc test revealed that there were two significant differences. The first significant difference ($p = .001$) was between those who had no instruction in TM (M = -0.095) and those who had some previous instruction in TM (M = 0.189). This had a low to medium effect size.[12] The second significant difference ($p < .001$) was between those who had no instruction in TM and those who had much previous instruction in TM (M = 0.23). This had a medium effect size (d = 0.46).[12] The lower mean of the "none" level suggested that those who had no instruction in TM had significantly *lower* gap scores than those in the other two groups (Table 4).

Research question four used a one-way ANOVA to investigate the likelihood of ATCs with master's degrees taking a TM seminar compared to the GSI. The results were statistically significant,

Table 4. Means of Knowledge, Competence, and Gap Indices by Previous Instruction Index (PII)

PII	Mean		
	Knowledge (KI)	Competence (CI)	Gap Score (GSI)
None	3.61	3.71	-0.10
Some	3.85	3.66	0.19
Much	4.04	3.81	0.23

$F_{4,139} = 2.52$, $p = .043$. This indicated that there was a statistically significant difference somewhere between the mean gap scores for the five levels of how likely the participants would be to take a TM seminar in the future.

The Tukey HSD post-hoc test revealed that the only significant difference between pairs of means ($p = .05$) was between those who were extremely likely to take a TM seminar (M = 0.34) and those who were not at all likely to take such a seminar (M = 0.08). The effect size was medium (d = 0.40).[12] This suggested that those with a lower gap score were *less likely* to take a seminar in TM, while those with a higher gap score were more likely. In combination with previously stated results, this suggested that generally, those with lower gap scores had less previous instruction in TM and would be less likely to pursue such instruction in the future.

Lastly, research question five investigated whether there was a combination of the eight types of instruction in TM that ATCs with master's degrees may have gained their competency in (course in undergraduate program, course in graduate program, GTA, professional development seminar, structured mentoring, athletic training content knowledge, experience on the job, observing others) that predicted their self-perceived competence level better than any one type of instruction alone. The results of the multiple regression indicated that two of the eight factors significantly contributed to the prediction of self-perceived competence $r^2 = 0.37$; adjusted $R^2 = 0.08$), over and above the contribution of all other factors (Table 5). The two predictive factors were competence from: 1) structured mentoring ($\beta = 0.17$, $p = .008$), and, 2) taking a TM course in an undergraduate program ($\beta = 0.120$, $p = .04$). The adjusted R^2 value indicated that 9% of the variance in self-perceived competence could be predicted by the combination of all 8 types of instruction. The effect size, $r^2 = 0.08$, was a medium effect size.[12]

When the data analysis was conducted, questions beyond the stated research questions arose about relationships between variables – specifically between the GSI, KI and CI. Further data exploration revealed statistically significant results between the GSI and both the KI and the CI scores. A Pearson correlation was used for both analyses. The relationship between the GSI and the KI was a positive correlation with a medium effect size ($r^2 = 0.09$).[12] This indicated that generally, the higher the gap score, the higher the knowledge score. Thus, those who had more TM knowledge generally perceived a larger gap between their knowledge of teaching and their self-perceived competence in teaching. Those with lower gap scores generally had less teaching knowledge. These results corresponded with the results presented previously. The statistically significant results of the GSI to the CI revealed a negative correlation with a low effect size ($r^2 = -0.01$).[12] This indicated that generally, the higher the gap score, the lower the self-perceived competence.

Limitations. Four limitations of this research study included: 1) it was unknown whether non-respondents to the survey were teaching or not, or had different characteristics than the respondents; 2) the response rate was low; 3) due to the low response rate, the generalizability of the results was limited; and 4) programs that were in candidacy should have been specifically included in the study population.

Discussion

The results of this study illuminated various relationships among the gap score, the knowledge index, the competency index, the previous instruction index, and the likelihood of the participants to pursue further instruction in TM. The importance of these relationships to the athletic training profession is discussed in the following section. A combination of these relationships points to a detrimental situation for the profession. Findings of this study are related to previous athletic training research and other allied health professions research in occupational therapy, nursing, emergency medicine and respiratory therapy.

The Gap Score. The knowledge index (KI) and the self-perceived competency index (CI), not surprisingly, were highly correlated $r^2 = 0.88$, $p < .001$) and had a very large effect size ($r^2 = 0.77$). These two indices comprised the formula for creating the gap score index (GSI), which was simply the knowledge score minus the competency score for each participant. Thus, not surprisingly again, the correlations of the KI to the GSI and the CI to the GSI were both statistically significant (Table 6), with medium ($r^2 = 0.10$) and low ($r^2 = -0.01$) effect sizes, respectively.

Interestingly, however, the KI to the GSI was a positive correlation ($r = 0.32$), indicating that the higher the knowledge score, the *higher* the gap score between that knowledge and their self-perceived competence. One could assume that the more knowledge one had, the *lower* the gap score would have been. A reason for this result may be that those who had more TM knowledge were more aware of what they *did not* know about the complexities of each of the 20 TM components. Conversely, the CI to the GSI was a negative correlation ($r = -0.18$), indicating that the higher the competency score, the lower the gap score between their knowledge and competence.

The GSI was investigated further when compared with the amount of previous instruction (PII) in TM of the participants. The statistically significant main effect results ($F = 3.52$, $p = .03$) yielded a simple effect between those who had no previous instruction in TM and those who had much instruction. The lower GSI mean of the "none" level suggested that those who had no instruction in TM had *lower* gap scores than those in the other two groups. This was counterintuitive and reinforced the results mentioned above. It appeared that those participants who had no previous instruction in TM and those who had lower scores on the KI, also had lower GSI scores. Practically speaking, this suggested that those with less previous TM instruction and/or less TM knowledge perceived less disconnect between what they knew about teaching and how competent they were to teach. A three-way relationship was emerging (Figure 1). When the KI was compared with the PII, the results revealed only one significantly different pair of KI score means (p=.011), again between the group

Table 5. Multiple Regression Coefficients Matrix of Types of Instruction in Teaching Methodology and Self-Perceived Competence Index (CI)

Factor	Unstandardized Beta	Standardized Beta	t	*p*
Course in undergraduate program	0 .120	0.175	2.023	0.045*
Course in graduate program	0.080	0.061	0.730	0.467
GTA	0.068	0.085	1.020	0.309
Professional development seminar	0.099	0.106	1.254	0.212
Structured mentoring	0.172	0.229	2.675	0.008*
Athletic training content	0.041	0.051	0.529	0.598
Experience on the job	-0.054	-0.067	-0.705	0.482
Observing others teach	-0.047	-0.066	-0.728	0.468

*Difference is significant at the .05 level

with no instruction in TM and the group with much instruction in TM. The results implied that those with less instruction in TM had lower KI scores. Thus, the findings indicated that the participants with lower gap scores had both significantly less instruction in TM and significantly less knowledge of TM.

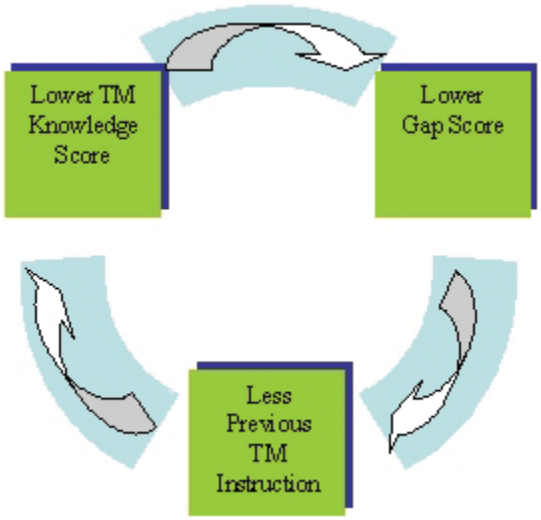

Figure 1. Relationship Between Previous Instruction Index (PII), Knowledge Index (KI), and Gap Score Index (GSI).

The last significant result concerning the gap score indicated that those who were more likely to take a TM seminar in the future were those with *higher* gap scores. Recall that those with the higher gap scores were already those with more knowledge of TM. Those with a lower gap score were less likely to take a seminar in TM, while those with a higher gap score were more likely. Thus, conceptually, in combination with the previously mentioned results, this suggested a more detrimental relationship between variables. Generally, those with lower gap scores had less previous instruction in TM, had less knowledge of TM, and were less likely to pursue such instruction in the future (Figure 2).

This is of concern to the profession. Those who are teaching, who have less TM knowledge, less previous TM instruction, and perceived less disconnect between their teaching knowledge and competency, theoretically, should be the ones who pursue future TM instruction. If those ATCs do not pursue TM instruction, our profession will continue to educate undergraduate students without the benefit of the most qualified instructors. Similarly, would it be beneficial for the profession to have ATCs with no background in research methods conducting research? Thus, it would be prudent for athletic training graduate programs to provide TM instruction in their curriculums to address this problem. Minimally, graduate athletic training programs should require one course in TM to prepare their graduates for this common job market demand.

The topic of preparing teachers/clinical instructors in allied health profession education programs to teach has been studied extensively by other professions.[13-17] Occupational therapy has devoted considerable research to improve the teaching quality of their faculty.[13-15] A study in the field of respiratory care concluded that training programs designed to improve effectiveness of clinical instructors showed significant improvements in teaching effectiveness when compared to control groups.[16] The preparation of nurse educators has similarly been studied with positive results supporting purposeful TM instruction to improve teaching.[17]

Self-Perceived Competency. Neither previous instruction in TM nor how long the participants had been teaching had a significant relationship to the CI scores. These results were surprising. One might assume that the more instruction one had, the more competent one might feel. Or certainly, the longer one teaches, the more competent one might feel. An athletic training education study by Stemmans supports this assumption.[18] An explanation for this is that perhaps the more instruction one gains in TM, the more new concepts one learns and attempts to implement in their classes. In turn, they may not feel very competent until they use the new concept for a semester/year or two.

Of the eight types of instruction in TM that may have contributed to the participant's self-perceived teaching competency,

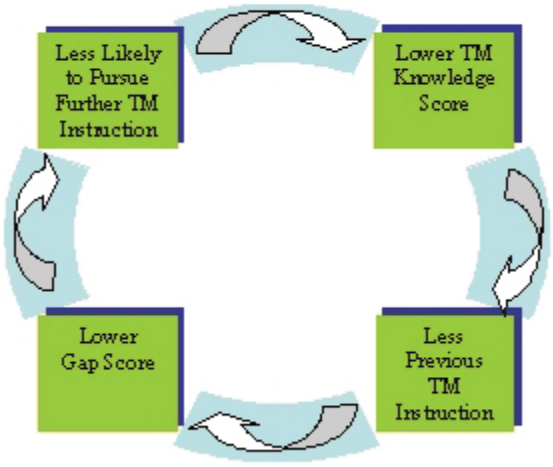

Figure 2. Relationship Between How Likely to Pursue Future Instruction in Teaching Methodology, Previous Instruction Index (PII), Knowledge Index (KI), and Gap Score Index (GSI).

the only two that significantly predicted the CI scores were: 1) taking a TM course in their undergraduate studies, and 2) the use of structured mentoring. Taking a course in their undergraduate program could have likely been a part of a teacher licensure program. This was not differentiated in the survey instrument. Structured mentoring requires working with a more experienced teacher as a pair to learn and grow in the teaching profession.[19]

The implications to our profession of these findings suggest that the undergraduate ATEP programs that include a pathway to teacher licensure are an important part of our profession, as are relationships between those just entering the teaching profession and possible mentors. These implications, however, must be interpreted with caution given the sample size and response rate of this study. Programs that provide an opportunity for a dual credential (athletic training and education) for students wanting to teach in the future are needed. These programs may be arranged at various institutions and add only one extra year to the undergraduate experience, while still meeting accreditation requirements. A further finding revealed that even though there were large numbers of participants who checked the three factors of: 1)athletic training knowledge, 2)experience on the job, and 3)observing others teach, as contributing to their teaching competence, these types of instruction in TM were not significant predictors of their CI scores (Table 5).

The influence of teacher preparation on clinical teaching activities and opinions of clinical instructors in the athletic training setting were studied by Foster and Leslie.[20] A survey was sent to 197 certified athletic trainers. The results indicated that clinical educators who had teaching degrees were more effective teachers in the clinical education setting. Further, ATCs with master's degrees demonstrated broader teaching activities than did ATCs with bachelor's degrees. The conclusions of the study were that teacher preparation and post-baccalaureate education were both desirable qualities when determining who to assign as clinical instructors. The Foster and Leslie study suggests two points: that instruction in TM improves teacher effectiveness and that holding a master's degree creates more effective teachers. Thus, does holding a master's degree in a related profession create more effective athletic training instructors? Of the two, taking a TM course or holding a master's degree, which is more influential for teacher effectiveness?

The results of this study support the Foster and Leslie[20] findings. Specifically, those in the "much" group of the PII perceived themselves to have significantly more knowledge of TM when compared with those in the "none" group. A difference must be pointed out, however, that having knowledge of TM does not transfer directly into being an effective teacher. Both of these studies reveal the efficacy of having TM instruction if one intends to teach. The Foster and Leslie study, which found that clinical educators with teaching degrees were more effective teachers in clinical settings, specifically confirms the importance of having ATEP programs with teaching certificate or licensure options to prepare these clinical educators.

Can taking one course in TM improve one's teaching skills? Studies by Veenman[21] and Rovegno[22] support the efficacy of taking one TM course to improve teaching skills. In relation to this study, "teaching skills" does not directly translate to teaching knowledge or to competence. However, if teaching skills are improved, there must theoretically be an increase in TM knowledge of some degree to improve teaching skills.

Teacher effectiveness of undergraduate athletic training clinical instructors has been studied utilizing various methodologies. One such study found that athletic training clinical instruction was positively influenced by the experience level of the instructor.[18]

By comparing behaviors among these groups [novice (n=10), intermediate (n=10), and advanced clinical instructors (n=10)], increased experience was directly correlated with athletic training student use of screening evaluation techniques. The data suggests that advanced clinical instructors allow athletic training students the most frequent amount of hands-on screening and evaluation time, while novice clinical instructors allow the least (p.52).

The importance of this study is that it illustrated teaching effectiveness differences between new and experienced athletic training instructors. This has implications to whether we should better prepare new teachers if, indeed, they are not as effective as they could or should be. This is not to say that better preparation and increased experience are the same. But rather, novice teachers who do not have experience may begin at a more competent level with better preparation.

The results of this study do not support the Stemmans[18] study results. If experience level can be measured by how many years one has been teaching, this study found that experience level was not significantly correlated with the participants' self-perceived competence. Again, these results must be interpreted with caution, as "experience positively influencing instruction" is a different measure than "experience positively influencing self-perceived competence". Regardless, the finding that the number of years teaching was not significantly correlated to self-perceived competence was a surprise from the data. Perhaps self-perceived

competence scores would have been higher if not measured on 20 separate and specific TM components.

Some other surprising findings from this study revolved around learning styles of students. In the past several years, there have been many studies published in the Journal of Athletic Training about learning styles of athletic training students and/or students in general.[23-32] The study of learning styles of students and educators reaches far beyond athletic training in the allied health professions. Emergency medicine, radiology, and nursing are a sample of other professions devoting significant research into learning styles.[33-37]

Of all the components of pedagogy and education, studies of this nature have been one of the most abundant in our profession. However, of the 20 components measured in this study, the two components with the lowest means for CI were assessing students' learning styles and matching instruction to students' learning styles. The means of these same two components were within the lowest three for KI means. Perhaps this is illustrative of the phenomena described earlier, in which once you learn more about a topic, you realize how much you really do *not* know about that topic. Conversely, perhaps the topic of learning styles is not valued in our profession beyond those who have researched it. How important is it for ACIs to understand the learning styles of their students? Is this importance different for students, for ACIs, and for didactic instructors? These questions require further inquiry.

It is important to note that these studies mainly address clinical instruction. While this is valuable, equally important is didactic instruction, which has rarely been studied in the athletic training setting. Many teaching methodologies and learning styles are common in both settings, but not all. The concepts and theories discussed in classroom settings lay the groundwork for developing skills and decision-making competence in the clinical setting. Making a distinction between clinical and didactic settings is necessary, as illustrated by a study of undergraduate athletic training students' learning styles in the classroom compared to the clinical setting.[24] The authors concluded that,

> …learning styles do indeed shift, depending on the domain through which an individual is learning. Consequently, teaching strategies incorporated in 1 setting may not be equally effective in the other setting. Each learning setting should, therefore, be treated separately in order to accommodate individual learning styles and maximize learning achievement (p. 441).

In a study by Mensch and Ennis, the focus was to determine to what extent theories of teaching, learning and achievement motivation were reflected in CAAHEP standards and guidelines, course syllabi in the programs, and student and instructor interviews.[38] The sample consisted of students (n = 21) and instructors (n = 12) from five CAAHEP accredited undergraduate athletic training programs. The results found that three pedagogical strategies – use of scenarios and case studies, authentic experiences, and establishing positive relationships - were acknowledged as positively influencing students' learning and motivation in these programs. The conclusions of the study were that both students and instructors recognize and value some specific theories of teaching and learning and achievement motivation in their programs. Without TM instruction, some instructors may not effectively utilize these specific theories/strategies and may, thus, not achieve the potential of student learning and motivation that exists.

Recall from the observation of the NATA Career Center website in April 2002, that roughly 73% of the available jobs that required a master's degree had teaching responsibilities associated with the job (Table 1). Additionally, the March 2006 review of this website revealed nearly 48% of job postings were for academic positions requiring teaching. When we consider the results of the Foster and Leslie[20] study, (clinical educators with teaching degrees were more effective in the clinical setting than those without teaching degrees) and the results of this study (those with "much" previous instruction in TM had significantly higher KI scores than those with "none"), a concern arises as to how well we are preparing our graduate students to teach and competently fill that job market.

Since nearly three-quarters of the available jobs advertised on the NATA Career Center web page required some teaching, shouldn't graduate students receive instruction and/or experience in how to teach before entering the job market? All athletic training graduate students are required to take research courses. Yet, only 26% of the participants in this study reported that they were currently conducting research. Knowledge of research is important not only to conduct research, but to be a wise consumer of research. Similarly, knowledge of TM is important not only to those with formal teaching responsibilities, but for all ATCs who work with athletic training students in any setting, regardless of the program's accreditation status. Certainly, with 73% of the available jobs for this population (ATCs with master's degrees) requiring teaching responsibilities, the importance of this preparation should be re-evaluated.

Conclusions

In the past, our profession had primarily and necessarily focused on the clinical skills of being an athletic trainer. Currently, however, the job market is changing. We are heading into a new era of a very different type of ATC becoming in demand – the academic ATC and/or clinical academic. This is a job market that is rapidly growing as the number of ATEPs seeking accreditation continues to grow. There are different job descriptions, different job responsibilities, and different job skills needed (for example - creating lesson plans, considering student-centered projects, varying teaching methodologies, and utilizing various assessment techniques) than the traditional ATC – the clinician. It would be fitting for the profession to provide for these new skills rapidly becoming in demand by employers across the nation.

The findings of this study point toward a need. When those with more previous instruction and more knowledge of TM have *higher* gap scores than those with less previous instruction and less knowledge, the gap score illustrates the phenomenon of *you don't know what you don't know*. As mentioned previously, this

phenomenon may be due to those having less instruction not knowing the complexities of the TM components, thus perceiving their level of competence with those components to be high. Therefore, the need established is not simply to provide more TM knowledge to those who need it, but to first provide an understanding of the complexities of TM and pedagogy in general. This should be done in an effort to create an understanding of what they do *not* know. Once these complexities are understood, instruction in TM would be more effective.

The purpose of this research study was to provide the profession of athletic training with information about the state of self-perceived TM knowledge and competence of those who are teaching in ATEP programs in order to determine if a need exists for further instruction in TM. The relevance of this study is that it is a national population study that provides specific and vital information never previously gathered about instructors of athletic training. This information should prove valuable to the profession and hopefully provide momentum for future research studies investigating the specialty of teaching in our profession.

Recommendations

Whether one is in the classroom or the clinical setting, one must learn and practice different strategies and skills to find what best fosters their students' learning. To this end, based upon the aforementioned conclusions, the following recommendations are proposed.

1) Include a TM course(s) *and* teaching experience in graduate programs.
2) Take a college course in TM (added benefit of CEUs).
3) Take TM professional development courses offered at NATA district / national meetings. This recommendation is proposed with caution, as one-shot seminars have proven to create little long-lasting change.[39]
4) Set up structured mentoring, including a formal relationship with a mentor and specific guidelines, goals, and expectations set in advance.

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