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ORIGINAL RESEARCH

Athletic Training Students' Perceptions of Translating Knowledge From Classroom to Clinical Practice

Cailee E. Welch Bacon, PhD, ATC*†; Ryan Kroskie, DAT, ATC, CSCS*‡;
Alicia M. Pike Lacy, PhD, ATC§; Julie M. Cavallario, PhD, ATC||
*Department of Athletic Training; †School of Osteopathic Medicine in Arizona, A.T. Still University, Mesa; ‡School of Human Performance, Anderson University, SC; §Athletic Training Programs, University of Maine, Orono; ||Athletic Training Programs, Old Dominion University, Norfolk, VA

Context: As the health care landscape evolves, athletic training students (ATSs) must gain the skills necessary to effectively translate new evidence into practice to optimize patient outcomes. Knowledge translation is an iterative process that promotes the application of new knowledge by users, but little is known about how students perceive this translation process during athletic training education.

Objective: To explore ATSs' perceptions of knowledge translation.

Design: Cross-sectional.

Setting: Web-based survey with open-ended questions.

Patients or Other Participants: A total of 255 professional ATSs accessed the survey; 168 students (118 women, 48 men, 2 missing; age = 22 ± 2.3 years) completed the entire survey (69.5% completion rate).

Data Collection and Analysis: A Web-based survey composed of 6 open-ended questions was distributed to ATSs via a recruitment e-mail forwarded by the Commission on Accreditation of Athletic Training Education-accredited athletic training program director on behalf of the research team. Due to the textual nature of the data, we used a multiphased, multianalyst data analysis approach guided by the consensual qualitative research tradition to analyze responses to the open-ended items. Self-reported topics that ATSs translated into clinical practice were categorized into the preestablished practice analysis domains identified by the Board of Certification.

Results: Topics within the examination, assessment, and diagnosis domain were most frequently reported by respondents. In addition to the topics translated, 3 themes emerged during data analysis. Students discussed their perceptions regarding the (1) application of knowledge gained in clinical practice, (2) challenges prohibiting successful knowledge translation, and (3) strategies to promote the knowledge translation process.

Conclusions: Findings from this study suggest a need to promote synergy between faculty and preceptors to ensure that didactically taught knowledge is aligned with what students are encountering during clinical experiences. Incorporating established knowledge translation strategies may help ATSs bridge the knowledge-to-practice gaps they perceive as current challenges inhibiting successful translation of new knowledge into the clinical environment.

Key Words: Knowledge translation, dissemination and implementation, knowledge transfer

Dr Welch Bacon is currently a Professor in the Department of Athletic Training and a Research Professor in the School of Osteopathic Medicine in Arizona at A.T. Still University. Address correspondence to Cailee E. Welch Bacon, PhD, ATC, Department of Athletic Training, A.T. Still University, 5850 E. Still Circle, Mesa, AZ 85206. cwelch@atsu.edu.

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Athletic Training Students' Perceptions of Translating Knowledge From Classroom to Clinical Practice

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KEY POINTS

- Athletic training students most frequently translate concepts within the (1) examination, assessment, and diagnosis and (2) therapeutic intervention domains of the Board of Certification practice analysis.
- The frequency of knowledge translation from the examination, assessment, and diagnosis, and therapeutic intervention domains may indicate that the patient care opportunities presented to students during their clinical experiences more frequently revolve around these domains of practice.
- Our findings suggest that the concepts students more readily translate into clinical practice may be dictated by the number of opportunities they receive for hands-on experience related to the concept(s) as well as the perceptions of others (ie, preceptors) about the relevancy of the information to contemporary athletic training clinical practice.
- The disconnect between knowledge gained in the classroom and the opportunities available during clinical experiences highlights a need to promote synergy between faculty and preceptors to ensure students are exposed to new knowledge and skills.
- Faculty and preceptors should ensure students are regularly provided opportunities for hands-on experience in all domains of practice to better facilitate the translation of knowledge and skill in clinical practice.

INTRODUCTION

The concept of knowledge translation has been around for decades but was not operationally defined until 2006 by the Canadian Institutes of Health Research. They defined knowledge translation as

> *the exchange, synthesis and ethically sound application of knowledge … to accelerate the capture of the benefits of research for patients through improved health, more effective services and products, and a strengthened health care system.*[1]

While this definition speaks to knowledge translation as the use of new evidence in clinical practice (eg, evidence-based practice), other authors, including Menear et al,[2] have simplified its meaning to a broader context by describing knowledge translation as the act of shifting knowledge into action. When knowledge is not translated into action effectively, a theory-to-practice gap remains.

The theory-to-practice gap has been well established in pedagogical literature and is especially prevalent in health care education, where students are expected to take didactically taught content and apply it in clinical settings.[3,4] In nursing, the theory-to-practice gap has been defined as a dissonance between desired and demonstrated learning.[4] While no such definition exists for athletic training, the theory-to-practice gap has been further emphasized in athletic training programs (ATPs) since the transition of entry-level education to the graduate level brought about new accreditation standards. These standards introduced significant changes in expected skill performance by graduates of such programs.[5] Students within ATPs are likely to be taught skills within the classroom that their preceptors have not been formally educated on. Therefore, students' opportunities to implement such skills during clinical experiences are inhibited. Even before introducing the new standards, the theory-to-practice gap had been identified in professional athletic training students (ATSs) and was classified by some students as a challenge they struggled with during their educational experiences.[6]

The theory-to-practice gap in health care education has motivated educators and clinicians to devise strategies to better bridge didactic learning with clinical practice application.[3,4,7] The concept of knowledge translation has been discussed relative to athletic training practice.[8,9] Welch Bacon et al[8] proposed the need for athletic trainers to develop and implement knowledge translation strategies to provide high-quality patient care effectively. Theoretically, the place in which athletic trainers should begin learning how to translate knowledge to bridge the theory-to-practice gap is within their professional ATP. Ultimately, the theory-to-practice gap should motivate students to conscientiously contextualize the didactic content they received and critically consider its importance in clinical practice.[3,6] Students who can do this demonstrate true knowledge translation and can bridge the theory-to-practice gap by providing care based on condition and individual patient circumstances.[6]

While knowledge translation is critical to students' growth and development and a key component of becoming a well-rounded clinician, little is known about how ATSs apply didactically gained knowledge into clinical practice or their perceptions of when and how knowledge translation occurs. Therefore, in this study, we aimed to explore ATSs' perceptions with knowledge translation during their professional athletic training educational experience.

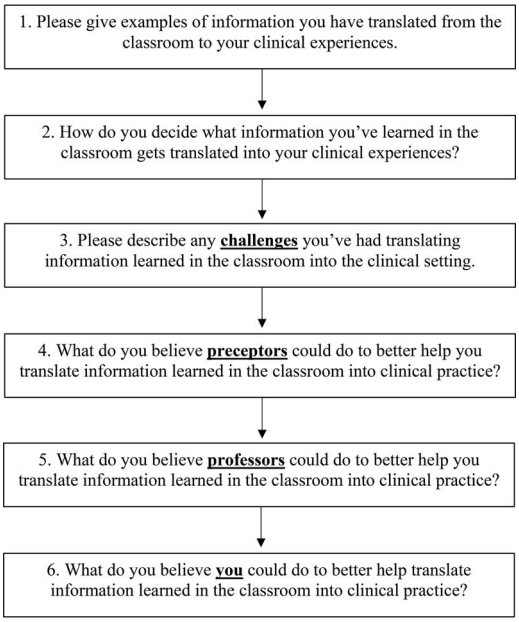
METHODS

We used a cross-sectional, Web-based survey with open-ended questions to explore professional ATSs' perceptions of and experiences with translating knowledge from the classroom into clinical practice. The A.T. Still University Institutional Review Board deemed this study as exempt research.

Participants

Athletic training students enrolled in a Commission on Accreditation of Athletic Training Education (CAATE)-accredited professional ATP were recruited at the time of this study. Since student information is not publicly available, participant recruitment occurred via e-mail to program directors (N = 385), who were asked to forward the recruitment e-mail to all enrolled students in their professional ATP. In total, 255 professional ATSs accessed our survey.

Figure 1. Flow of open-ended survey items.



Instrumentation

After an unsuccessful search of the available literature for an established instrument to address our study purpose, we developed a brief, Web-based survey hosted on the Qualtrics platform. The survey consisted of 7 demographic items and 6 open-ended questions (Figure 1). Once developed, the survey was reviewed for face and content validity by 3 athletic training educators with experience in qualitative and survey research using an established validation process.[10] Based on the feedback provided, we adjusted the wording of 2 survey items to enhance clarity. Due to the open-ended nature of the survey items, a reliability analysis was not warranted. However, to confirm clarity and comprehension of the survey questions, the survey was sent to 18 postprofessional master's ATSs for piloting purposes once the face and content validation was complete. Sixteen students completed the survey, and no additional modifications were made to the instrument based on the feedback provided.

Procedures

We sent a recruitment e-mail containing an introduction to the research team, the purpose statement of the research study, the estimated time needed to complete the survey (ie, 10 to 15 minutes), and a URL link to the Web-based survey to all program directors of CAATE-accredited professional ATPs in February 2020 (Figure 2). We asked each program director to forward the recruitment e-mail to all current ATSs enrolled in their program. Four e-mails were returned upon distribution; 1 was undeliverable, and 3 indicated the program director was out of the office for the entirety of the data collection period. Four program directors responded that they did not currently have students enrolled in their program. Therefore, the recruitment e-mail was received by 377 eligible and available program directors of CAATE-accredited professional ATPs. Data collection occurred during a continuous 4-week period, and 2 reminder e-mails were sent to program directors to encourage participation from ATSs. Due to the exempt nature of this research study, participant consent was implied upon voluntary completion of the survey items.

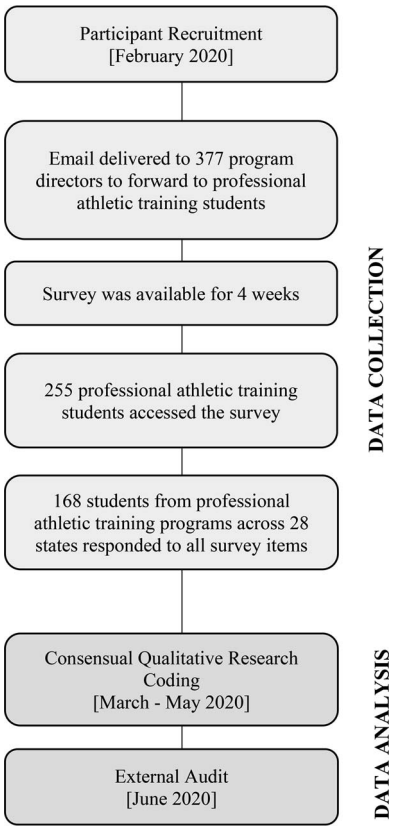
Data Analysis

Due to the structure of the survey, only the responses from participants who replied to all open-ended items were included in the data analysis. While participants were not required to respond to each survey item to ensure their voluntary rights within exempt research were upheld,[11,12] during data analysis, we determined that responses to all survey items were necessary to understand participants' perspectives regarding knowledge translation. Descriptive statistics characterized participant demographics using SPSS (version 27; IBM Corporation). At the same time, all textual data collected from the open-ended response items were analyzed using the consensual qualitative research (CQR) approach.[13,14]

The CQR tradition uses an inductive approach to data analysis and requires a research team and a multiphase consensus process. For this study, we used a 4-person data analysis team (C.E.W.B., R.K., A.M.P.L., J.M.C.). Three members of the team were established qualitative researchers, while 1 member was a novice researcher and went through the appropriate CQR training process as discussed by Hill et al.[13] One member of the team served as the external auditor (J.M.C.), while the other 3 members were involved in each phase of data analysis. Near the end of data analysis, the external auditor completed a comprehensive review of all phases to confirm the final themes and categories were representative of participants' perceptions and experiences.[13,14]

During the first data analysis phase, 3 members individually coded the first 25 participant responses and independently developed a codebook. The research team then met to discuss and develop a consensus codebook representing emergent

Figure 2. Study procedures flowchart.



themes and categories. The consensus codebook was then used for the second phase by coding the next 25 responses. No changes were made to the codebook by the end of phase 2, thus establishing the final consensus codebook. During phase 3, the 3 team members coded all remaining responses and met to confirm the codes. Next, all coded participant responses were separated into the respective themes and categories, and the external auditor reviewed all emergent findings. The Consolidated Criteria for Reporting Qualitative Research was used to ensure the conclusions of this study were comprehensively reported.[15]

The survey asked students to provide examples of information they have translated from the classroom to clinical experiences. During data analysis, we chose a deductive approach to analyze the data collected from this specific survey item since participants' responses closely aligned with the domains of athletic training practice established by the Board of Certification (BOC).[16] While still following the consensus approach described, we coded participant responses to this survey item into preestablished categories: injury and illness prevention and wellness promotion; examination, assessment, and diagnosis; immediate and emergency care; therapeutic intervention; health care administration and professional responsibility.

RESULTS

Since all survey items were optional to maintain participants' rights, we deemed a survey complete if the respondent answered all the open-ended survey items. Therefore, of the 255 students who accessed the survey, we received completed responses (65.9% completion rate) from 168 students (118 women, 48 men, 2 missing; age = 22 ± 2.3 years) enrolled in CAATE-accredited professional ATPs in 28 states. Additional respondent demographics are displayed in Table 1.

Figure 3 displays the breakdown of the topics translated into clinical practice. In addition to the topics translated into clinical practice, 3 themes emerged during data analysis: *application of knowledge to clinical practice*, *challenges prohibiting successful knowledge translation*, and *strategies to promote knowledge translation*.

Application of Knowledge to Clinical Practice

Students identified several factors influencing their opportunity or willingness to apply knowledge gained from the classroom to clinical practice. During data analysis, 4 categories emerged: *student self-efficacy*, *setting- or patient-driven application*, *preceptor-driven application*, and *classroom-driven application*.

Student Self-Efficacy. One of the factors that influenced students' willingness to apply knowledge from the classroom during clinical experiences was their self-efficacy, that is, their belief that they can execute behaviors and tasks to produce specific performance results.[17] One student remarked:

> *[O]bviously, it depends on what you feel confident doing and what skills you have acquired . . . I know I am not the best at some of the skills I have learned so far, but practicing them will only help me improve.*

Table 1. Participant Demographics (N = 168)

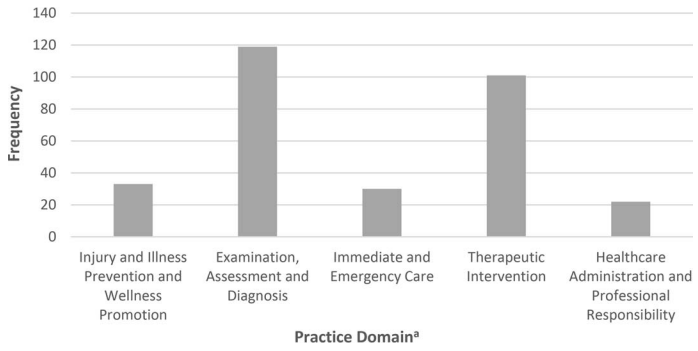
Demographic Variable	No. (%)
Program type	
Undergraduate	117 (69.6)
Graduate	49 (29.2)
Missing	2 (1.2)
Semesters completed in program	
<1	3 (1.8)
1	25 (14.9)
2	34 (20.2)
3	43 (25.6)
4	11 (6.5)
5	33 (19.6)
6	2 (1.2)
7	11 (6.5)
8	1 (0.7)
9	3 (1.8)
Missing	2 (1.2)
Completed an immersive experience	
Yes	120 (71.4)
No	34 (20.2)
Unsure	12 (7.2)
Missing	2 (1.2)
Clinical experience settings completed[a]	
College or university	162 (39.1)
High school	130 (31.4)
Elementary or middle school	3 (0.7)
Rehabilitation center or clinic	46 (11.1)
Physician's office	40 (9.7)
Hospital	8 (1.9)
Industrial or occupational health	4 (1.0)
Performing arts	5 (1.2)
Military	1 (0.3)
Professional sports	10 (2.4)
Other	5 (1.2)

[a] This demographic item was a *select all that apply*; 414 responses were provided.

Another student commented that he or she usually applies knowledge from the classroom "only when I can successfully and correctly apply the information independently."

Some students discussed how their motivation to include knowledge gained from the classroom is driven by which topics

Figure 3. Frequency of topics translated into clinical practice by athletic training practice domain (n = 168). [a]As identified by the Board of Certification Practice Analysis, 7th edition.



are most interesting to them. One student explained, "I feel that the topics and information that I find to be the most interesting in the classroom is the information that I'm more willing to apply during clinical experiences." Others related translating information based on their comfort. One student commented, "I usually translate something if I feel comfortable doing it." In contrast, another student noted that "it depends on how well I understand the topic and if I can see the practicality of doing it in clinical practice." A third student explained:

> *[O]nce I have learned the information in class and have been cleared by my preceptor, I should be able to translate that skill to clinical practice . . . At that point, it is really up to me to be comfortable and confident enough to perform the skill during my clinical experience.*

Finally, 1 student described that translating knowledge from the classroom to clinical practice was about taking opportunities to do so when they become available. He or she commented:

> *You simply have to put yourself out there! When an opportunity is present, dive right in so you get the chance to show off your skills and the knowledge you are collecting in class and from this [clinical] experience. Learning happens by making mistakes. It's all about the process.*

Setting- or Patient-Driven Application. In addition to student self-efficacy, participants also described how the clinical setting or the patient population influenced their application of knowledge gained from the classroom. One student remarked:

> *It depends on if the class material is pertinent to what I actually see in the clinic. Skills like lower-body evaluation are very applicable because I do that every day in the high school setting, but sometimes the material we cover [in class] is not like what we actually see in that setting. Another factor is time constraints. We can learn a lot of great things in class, but if they take too long or require too much equipment, they are not feasible to actually carry out in clinic—especially at the high school setting.*

Another student commented on how exposure to particular patient cases affects what information gets translated into clinical practice. He or she commented:

> *I decide what information is translated from the classroom to clinical experience when it is applicable to what I am doing in the clinical experience. If I have zero exposure to something I learned in class, I find it useless. It is one thing to be lectured to about a possible situation I may experience sometime in the future and a whole different thing to have experience with real-life situations every day.*

Students also wrote about the connections between theory and practice and how that bridge relates to the patient populations they encounter during their clinical experiences. One student noted, "[T]he types of patients and injuries I see in clinical determined what information from the classroom is useful." Another student stated:

> *[I]f any of the information I learn in class is applicable to clinical practice, I translate it to clinical practice, but if what we learn in class cannot be used or is not practical for the setting I am in, then it doesn't translate.*

A third student remarked how "philosophies taught in the classroom are sometimes not accepted or practiced at my clinical experiences," while a fourth student summarized the bridge between theory and practice by noting:

> *[C]lassroom talks mostly about theory. Some things work in theory but not in practice. If they don't work with the patients you treat, they don't translate well, but if things work both well in theory and in practice, they do translate well.*

Preceptor-Driven Application. Students also described the influence of preceptors on what knowledge a student decides to translate to clinical practice. One student noted that "much of the information I have translated to my clinical experience is led by the preceptor I have at the time. I ask for [his or her] advice and try to learn from their experiences." Similarly, other students remarked, "I talk to my preceptors and get their opinion[s] on whether certain skills and knowledge taught [in the classroom] are useful," and, "I use my preceptors as a basis as to what information is necessary to be used in clinical [practice]." One student shared:

> *[A]fter class, I like to discuss the key points that I retained from class with my preceptors and deciding together how I can implement that information or if there are other options for how things are done.*

Students also wrote about how their preceptors' reactions to new knowledge were a deciding factor in whether they chose to translate it into practice. One student stated, "It depends on the clinical site I'm at and how willing the preceptors are to accept new ideas or ways of practice." Another student described, "[I]f I ask my preceptor and they seem agreeable about [the knowledge], then I may incorporate it. However, if they shoot down the idea, I am far less likely to introduce it into my own care."

Classroom-Driven Application. While not as common as preceptor-driven application, students also described the classroom's role in knowledge translation. One student noted:

> *[M]uch of the information from the class should be translated to clinical practice because the class is what is preparing us for the clinical experience. We go to class for the sole purpose of learning what to practice.*

Similarly, another student remarked, "I feel as though anything we have learned in the classroom is fair game to be used in my clinical experiences."

Other students remarked how they intentionally try to support what they learned from the classroom into practice. One student stated:

> *I reinforce things I've learned in the classroom that I see at clinical [experience], and if my [preceptor] does it differently, I will ask why and then decide what better suits me and my skills.*

Other students commented, "I try to implement all information learned in the classroom into my clinical experiences and use my actual experience to grow and be more confident in my own knowledge," and, "I try to incorporate everything I learn in the classroom, but if those strategies don't work for

me, I can feel free to try something new." Finally, 1 student summarized classroom-driven application by noting:

> *I think that everything [from class] gets translated [to clinical practice]; it's just that sometimes some things that I learn in the classroom get used more often than others. Everything that I have learned within the classroom has been or will be beneficial in my clinical practice.*

Challenges Prohibiting Successful Knowledge Translation

Alongside exploring the factors that influence decisions to translate knowledge from the classroom to clinical practice, we also asked students to discuss the challenges they have encountered that prohibit successful knowledge translation. Five categories related to challenges emerged during data analysis, including *relatability between key stakeholders*, *classroom relevance*, *knowledge prioritization*, *limited exposure to content taught in the classroom*, and *self-confidence*.

Relatability Between Key Stakeholders. One of the challenges students wrote about regarding knowledge translation was the relatability between key stakeholder groups. Some students commented that the unique ways educators teach the same content posed a challenge. For example, 1 student commented, "[I]f teachers have different ideas on how topics should be taught, it can be challenging and confusing to translate that information to the clinical setting due to differences between classes." Another student mentioned, "It is also hard with conflicting information in different classes to decide what you think is correct or how to use your discretion."

Other students discussed how differences between educators and preceptors created knowledge translation difficulties. One student noted, "[M]any different opinions and views can make it difficult to put into practice what I learn in the class." Another student stated, "[O]ne main challenge I have encountered is that different professors and preceptors do and teach things very differently, so it is sometimes hard to find your way of doing things." Similarly, a third student described that

> *some preceptors have learned in different ways and do not agree with the techniques we learn in the classroom. This is challenging because we learn one thing but get told to do it a different way during our clinical [experience].*

Students also described the challenges of translating knowledge when preceptors disagree with what is taught in the classroom. One student commented, "[P]receptors don't believe in some of the things we learn [in the classroom]." Similarly, another student noted that

> *sometimes our clinical supervisors don't believe in the things we learned in class are applicable to a clinical setting, or they don't have the knowledge because it is new, so they cannot help either way.*

Likewise, 1 student remarked that

> *what we learn in class is very academic and not really practical in the clinical setting. On top of that, different preceptors do things differently and don't practice certain things we learned in class.*

Classroom Relevance. In addition to the relatability between key stakeholders, students also struggled with translating knowledge from the classroom to clinical practice when they could not grasp the relevance of what was taught. One student explained:

> *I have learned a plethora of special tests that I am constantly then told, "You'll never use this in real-life," or, "This isn't a good test, but you have to know it." It is frustrating to learn information that I may never use. Similarly, we are taught in class to use goniometry with everything evaluation when testing [range of motion], yet I have been told time and time again that preceptors never use a goniometer other than postoperation.*

Similarly, another student commented, "[W]e are taught a lot of tests or ideas in class that are not clinically significant, which makes it difficult to decide exactly which ideas we should focus on in clinical practice." A third student stated, "[W]e learn by the book for everything, but not everything is done by the book in the clinical setting, which tends to get me confused."

Several students also expressed frustration that what they are taught often feels dichotomous, indicating that knowledge is either taught "the [BOC] way versus how clinicians actually practice." Another respondent said, "[I]n the classroom, we learn that things are done in a set pattern; however, in the clinical setting, that is almost never the case at all." Students also commented that they believe "the information I've learned in the classroom is not representative of what is realistic within many athletic training settings" or that "the classroom tries to make everything black and white, but there are a lot of gray areas in the clinic."

Knowledge Prioritization. Knowledge prioritization was another challenge that emerged during data analysis. Students expressed difficulties identifying which knowledge and information were more critical or applicable in a given scenario. One student described:

> *It is difficult to recall necessary information while in a clinical setting sometimes. Since the scope of knowledge that we are required to have is so large, information recall on the spot at a clinical setting can be difficult.*

Another student commented, "[T]he hardest thing about translating information from the classroom is figuring out what is most important in this scenario compared to what is not as necessary." A third student remarked:

> *[W]hen to use the information you learned [in class] is so hard because you are learning so many things, and not all of them happen during the [clinical] experience. Every scenario is different, so being able to adjust is hard.*

Finally, one student explained:

> *I find it hard to translate information learned in the classroom if a certain situation does not happen while we were at our clinical site. It is hard to practice emergent care when there are no emergencies. Some preceptors are great at simulation, while others are not. This can pose as a challenge as well.*

Limited Exposure to Content Taught. Students frequently described limited or lack of exposure as a challenge to

translating knowledge from the classroom to clinical practice. One student remarked, "[A]s someone that learns by doing, if I learn something and am not able to implement it at that time, there's a high likelihood I will forget about it." Other students commented about the disconnect between when a concept is taught in the classroom and when or if they experience it during clinical experiences. One student explained:

> *[S]ometimes we learn something months prior and never get to do it again until it comes up during our clinical [experience]. If it's several months from when I learned it, I tend to have a much harder time with it.*

Similarly, another student wrote, "[I]t is difficult to translate knowledge on a topic or skill that doesn't get used often or during situations you are not placed in." One student summarized that "in an actual emergency situation, no [amount of] classroom practice will actually prepare you for that actual, real-life moment."

Students also described how particular topics or settings impeded their knowledge translation. One student noted the "university/college setting is very limited in the variety and number of patients and injuries I am exposed to," while another student commented, "I have a hard time translating my shoulder evaluation skills in my clinical experiences because most of the rotations I have had are mainly lower extremity only." Finally, several students wrote about the challenges of translating administration-related tasks. One student explained, "[T]ranslating topics we discuss from my athletic training administration class are very difficult because we don't really get any opportunity to do those aspects during our clinical experience."

Self-Confidence. In addition to external variables affecting knowledge translation, students also detailed how their self-confidence impeded their ability to translate knowledge from the classroom to clinical practice. One student explained:

> *I think the biggest challenge I have when taking it from the classroom to the clinical site is just being confident in my abilities. I know and feel like I am doing it right in class, but I just have to trust my practice and training and be confident in the things I do with patients.*

Another student noted, "[I]f I've had trouble conceptualizing what was learned in the classroom, I'll likely struggle with it in the clinic. It's really about my confidence in that skill." Several students also commented how they "lack the confidence to complete tasks, especially if someone is standing over me and critiquing what I am doing." Other students discussed how their confidence waivered when they had to explain something to someone else. One student stated:

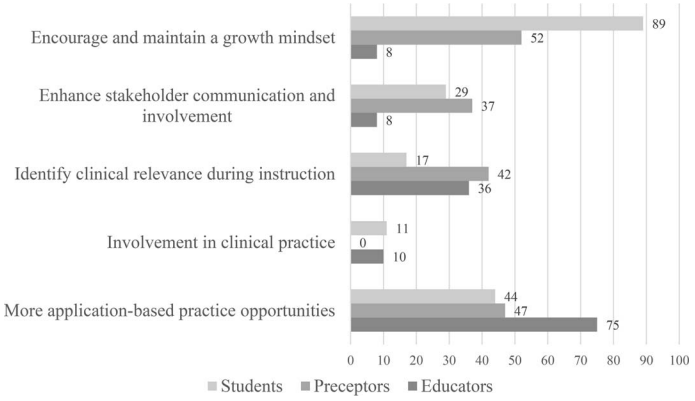
> *I sometimes have a challenging time explaining to patients what I am doing. Well, I know what I'm doing, but sometimes it is hard for me to put it in words that they would understand.*

Finally, numerous students described their struggle with self-confidence because they "don't want to mess up in front of a patient or preceptors."

Strategies for Successful Knowledge Translation

We asked participants to describe strategies they believe educators, preceptors, and students could employ to strengthen the translation of new knowledge from the classroom into clinical practice. Data from these responses were reduced into 5 distinct categories that focused on *more application-based practice opportunities*, *involvement in clinical practice*, *identifying clinical relevance of content during instruction*, *enhancing stakeholder communication and involvement*, and *encouraging and maintaining a growth mindset*. The number of participant responses coded into each category by stakeholder group is displayed in Figure 4, and supporting quotes are provided in Table 2.

Figure 4. Students' perceived strategies for knowledge translation by stakeholder group.



More Application-Based Practice Opportunities. Our participants agreed that all 3 stakeholder groups (ie, educators, preceptors, and students) should seek and provide more application-based practice opportunities to allow students to gain hands-on exposure to new content learned in the classroom and during clinical experiences. Students generally described that educators should shift away from lecture-based classroom teaching methods and focus on providing more active learning approaches. At the same time, preceptors should offer more opportunities for students to practice skills and simulated patient encounters during clinical experiences. Students also self-reflected that they should be more proactive in seeking practice-based opportunities, whether with fellow students, peers, or their preceptors during clinical experiences.

Involvement in Clinical Practice. Although not as prevalent as the other categories within this theme, some students wrote about the need for educators and students to be more involved in clinical practice. For the educators, students described that having faculty that actively practice in the clinical setting would be beneficial because they can discuss current practice trends with recent patient case examples. Students, on the other hand, identified that they need to be more proactive about being actively involved in patient encounters that occur during clinical experiences rather than observing them.

Identifying Clinical Relevance of Content During Instruction. Participants identified that educators, preceptors, and students must work toward identifying the clinical relevance of content taught during didactic instruction. Students shared that it would help make stronger connections between the classroom and clinical practice if educators could share more current examples of how the content being taught directly connects to contemporary athletic training practice. Likewise, students highlighted the value added if preceptors also discussed connections between didactic content and

Table 2. Strategies for Successful Knowledge Translation Supporting Participant Responses Per Stakeholder Group

Category	Educators	Preceptors	Students
More application-based practice opportunities	*More hands-on learning and less lecture-based learning. I would say that most people going into this profession are hands-on learner so I think it would be appropriate to teach students in the best way they learn as well as the most practice way to learn if possible.* *Sometimes labs feel rushed and more of an afterthought; I wish we had more hands-on experience with the things we are actually expected to do in clinical practice.* *Incorporating more hands-on learning. The more engaged students are, the more the information seems applicable to real-life situations.*	*Some preceptors are better than others with allowing students to help with evaluations and work through the cases in real time rather than just having us watch what they are doing.* *I feel like preceptors are good about showing me how to do certain things but could improve on letting me practice those skills on patients or in mock scenarios.* *I think it is important to allow the students to evaluate a patient first by themselves, and then have the preceptor evaluate the patient and explain to the student what they missed AND what they did correctly. A lot of times students will do what they remember from class, but that doesn't mean they did everything or didn't leave something out. It's good to have to think through and try on your own, but there should be follow up from the preceptor every time.*	*I believe I could do a better job of speaking up for myself at my clinical sites by asking to do the next patient evaluation that comes in.* *I am a visual learner, so I need to continue to practice and create opportunities when they aren't immediately available. I tend to remember the most information when I can apply it hands-on.* *I believe I could look for more opportunities to practice certain things in the athletic training [facility]. I could do a better job of trying to be in the proximity when a patient is being evaluated to better understand what the evaluation consists of and then asking to practice those skills with my preceptor during downtime.*
Involvement in clinical practice	*I wish my professors still practice athletic training. Many of them have been out of the field for a significant time. I think if they took the opportunity practice it would help them understand the situations we are in now.* *I think professors either need to be clinicians or actually see what happens on a daily basis.* *Personal experiences are very helpful for me to connect the material and allow me to better understand what is expected of me as a certified athletic trainer. I appreciate the professors I have that are still providing patient care on a regular basis and can share those experiences more often.*	No responses provided	*I need to push myself to be more involved during clinical experience. It is easy for me to just sit back and be a bystander, but I realize I don't get much out of doing that.* *I think taking a more active part in my clinical setting could help me better translate information learned in the classroom.* *I need to be more intentional about initiating first encounters with the patients that walk into the facility rather than waiting for them to approach me.*
Identifying clinical relevance of content during instruction	*It would be nice for the professors to separate what we are supposed to know for the [BOC] exam from what we will realistically see in clinic to help clear up any confusion.* *It would be helpful if professors could provide real-world*	*I wish preceptors would explain what they are doing while they are doing it more often.* *Preceptors could really help by explaining why they make the decisions they do, or how they developed their practice into what it is today. For example, explain why they choose the*	*I think I could be a little more proactive about explaining what I'm doing to patients or my preceptor. That could help me store the information in my head better.* *Because we are taught many things in class that we have all seen applied differently*

Table 2. Continued

Category	Educators	Preceptors	Students
	examples when teaching new [content]. Let students know what really is applicable and what is not and provide sensitivity and specificity values for special tests to help student better know what is valuable information in their clinical evaluations. *I wish [professors] would make the material more applicable and give examples of how it is used or when to use it over something else during clinical practice.*	*ankle exercises they do and why they use certain interventions over others.* *I think a preceptor taking the time to explain why they don't do certain things we learned about in class would be beneficial, as well as providing resources and research to support their methods.*	*once we get into the clinic, asking our preceptors in the appropriate environment, at the appropriate time, without coming off as questioning their competence, can be a great learning tool.* *I need to do better about asking my preceptors to explain the connection or clarify how something we learned in class is related when I am unsure.*
Enhancing stakeholder communication and involvement	*Professors should communicate more with preceptors to let them know what we are covering in the classroom.* *Professors should do a better job of visiting clinical sites to observe what the preceptors and students are doing at that site.* *I wish my professors would ask us what is going on at our clinical sites and whether we have been able to practice what we just covered at clinical. Or, ask us what our preceptors think about the information we covered in class.*	*I believe that programs would work a lot more efficiently if preceptors and professors communicated what the students are (supposed to be) learning so the preceptors understand where the students are progress-wise.* *I wish the preceptors were more familiar with the methods we learn in the classroom. Many times, we learn things and then never use them again because none of our preceptors do it that way.* *There needs to be more communication between the classroom and preceptors. Be aware of the material we are learning so they can help us apply it.*	*I could do a better job of talking to my preceptor about what I am learning in the classroom and asking what their experiences has been with [that content].* *I could take the initiative to ask both my preceptor and professor about why some things are learned in the classroom but then never used in the clinical setting.* *I need to remember to ask my professors and my preceptor at the time to explain concepts or practice skills I feel uncomfortable with to help me make the connection.*
Encouraging and maintaining a growth mindset	*Professors sometimes teach things that they know very well or believe in which could close the students off from alternative ways of thinking about or completing tasks.* *My preceptor likes to put me in situations that are out of my comfort zone and have me explain my way out and think through each step. I wish my professors would incorporate more of that strategy in the classroom.* *I wish my professors would incorporate time during class for us to ask questions or go over things that arise in clinical practice that we are unsure about or that we haven't learned yet but have questions about.*	*I believe some preceptors should take their continuing education more serious and remain up to date on available evidence so when we have questions, they can give us a well-thought-out response backed by what is current, or at least be able to guide us in the right direction to find the answer on our own.* *I wish some preceptors would try to be more approachable, educating students during all available opportunities and placing students into situations that may be out of their comfort zones. Also being open-minded that their current practices aren't always the "best" practices. I wish they would allow our thoughts on what we learned to help them stay up to date on the latest practices.*	*I need to always be willing to learn and not be afraid to mess up. I also need to be diligent in my practice opportunities and not become complacent or satisfied with what I already know—I must strive to be better and look for ways to improve.* *I am often worried about offending preceptors or questioning their techniques and making them upset, but being able to ask more questions to preceptors about why they do or don't utilize certain techniques would really help me to make my own decisions about what I want to incorporate.* *Learning from all different health care professionals at my clinical site rather than*

Table 2. Continued

Category	Educators	Preceptors	Students
		Some preceptors could try to learn from us and the way we were taught a certain skills [sic] to try and help us better understand it. They all have their own ways of doing things, and that is completely okay, but it would help to practice the same skill the same way when we are first learning it.	*just my preceptor would probably help me grow. There is more than one way of thinking and more than one way to do things. If I collaborate with others and learn from different people, I might be more out of the experience.*

clinical practice more positively rather than dismissing newly learned content as irrelevant to clinical practice. Some students also wrote they could be more proactive about seeking the relevancy of the content they are being taught.

Enhancing Stakeholder Communication and Involvement. Students wrote about the gaps in communication they have noticed between educators and preceptors and how a lack of involvement from preceptors in the classroom and educators in the clinical practice environment affects the knowledge they translate. In general, students expressed a need for more collaboration between the 2 groups to help students feel more confident in the content being discussed in both realms. Additionally, students expressed a desire for more learning opportunities from preceptors and more in-depth discussions with preceptors to gain a better theoretical understanding of why a particular approach is most appropriate from the preceptors' perspectives.

Encouraging and Maintaining a Growth Mindset. Finally, our participants described the importance of encouraging and maintaining a growth mindset. They addressed the desire for preceptors to push students to make clinical decisions and then explain their rationale out loud regarding those decisions. They also remarked how preceptors should be more open to learning as a 2-way process in which the student can contribute contemporary and up-to-date knowledge during discussion of particular content areas. Students also reflected on their growth mindset and how they could be more proactive in their learning experience by asking more questions, reflecting on the content taught in the classroom, and seeking out more opportunities to apply or practice what they have been taught rather than waiting for the opportunity to be presented to them.

DISCUSSION

Knowledge translation is a dynamic and iterative process employed to improve individual and population health, fortify health care systems, and provide more effective health care services to patient populations. Knowledge translation includes synthesizing, disseminating, exchanging, and applying knowledge in clinical practice to benefit the patient.[18] Our participants identified topics translated into clinical practice and further expanded on the facilitators of knowledge translation by applying knowledge to clinical practice. Translating knowledge to clinical practice was possible due to student self-efficacy and with facilitation through patient-, preceptor-, and classroom-driven approaches. Participants in our study also noted challenges that included relatability between educators and preceptors, the relevance of knowledge taught in the classroom, the need to prioritize which knowledge should be translated, limited exposure in clinical practice to content taught within the classroom, and a lack of self-confidence in their knowledge. Lastly, our participants identified strategies to overcome these challenges, such as being provided more application-based practice opportunities, identification of the clinical relevance of didactic content during the initial instruction of the topic, increasing clinical practice experience among educators, enhancing communication between educators and preceptors, and finally, the development and maintenance of a growth mindset throughout knowledge acquisition and translation processes.

Mechanisms for Knowledge Translation and Topics Translated

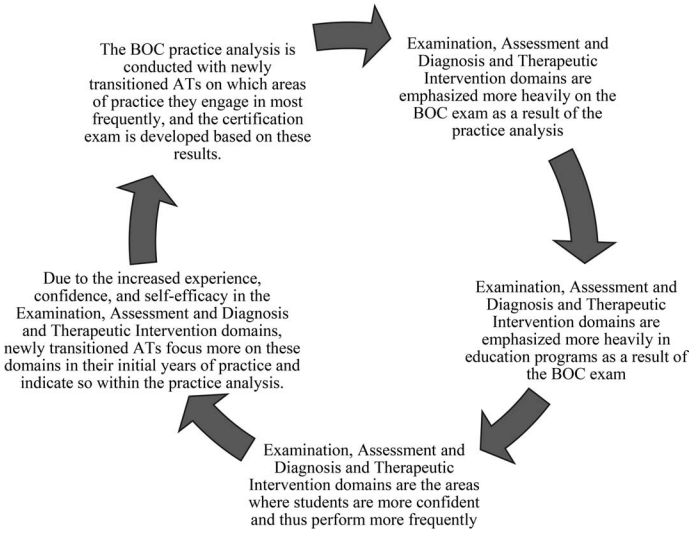
The participants in our study identified that self-efficacy, patient-driven opportunities, and preceptor-driven opportunities all contribute to their ability to translate knowledge. Participants also noted that, in some instances, content covered in didactic settings was not always readily translatable to the clinical setting.

The construct of self-efficacy has been widely studied within athletic training education and external to the profession. Self-efficacy is driven by 4 contributing factors: past accomplishments, vicarious experiences, verbal persuasion, and emotional arousal.[17,19] When applying this construct to clinical education, *past accomplishments* would constitute successful past performance of a skill (clinically or didactically), *vicarious experiences* would include observation of someone else successfully performing a skill, *verbal persuasion* would consist of being encouraged to perform the skill by an instructor or preceptor, and *emotional arousal* would include the emotional response when presented with an opportunity to perform a skill, such as excitement or nervousness. Self-efficacy is rooted in other psychological constructs, such as reward-based motivation, self-regulation, and anxiety.[17,20,21] Applying this context to our findings, we can reasonably determine that, when students are allowed to translate knowledge into clinical practice, the following factors will likely influence their ability and willingness to do so. Past accomplishments, such as having a previous clinical opportunity or high-fidelity simulation in which the student could apply knowledge successfully, would influence their willingness and ability to translate knowledge in similar opportunities in the future. The frequency of the opportunity to observe a classmate, preceptor, or another clinician translating the same knowledge to practice will make it more likely that a student will do the same. Encouragement from preceptors during patient

encounters to inspire students to translate knowledge effectively would also support the knowledge translation process. Lastly, individuals are most likely to be motivated to translate knowledge when the knowledge itself is of high interest to them and their practice.[8]

The types of knowledge that our participants described translating most often were in the 2 domains of *examination, assessment, and diagnosis* and *therapeutic interventions*. In part, they indicated that these areas were most common because of the opportunities presented to them during their clinical experiences. Data on patient encounter opportunities indicate that ATSs participate in evaluation and examination, application of therapeutic modalities, and care, treatment, and rehabilitation for more than three-quarters of their patient interactions while in clinical experience.[22] Based on this information, we feel that the content areas of the self-reported knowledge translation of our participants are likely highly accurate. Additionally, the BOC conducts a practice analysis using responses from early professionals that have more recently transitioned to practice. This analysis serves as the blueprint for developing the credentialing examination for athletic trainers.[16] In the 8th edition of this document, the domains of (1) assessment, evaluation, and diagnosis and (2) therapeutic interventions are the heaviest-weighted domains on the BOC exam.[23] Due to the emphasis on the exam in these content areas, education programs will likely emphasize this content more heavily. Thus, students will have greater self-efficacy around skills within these 2 domains. We would postulate that this contributes to students' comfort and confidence in translating knowledge in these areas when presented with patient encounters that warrant evaluation and diagnosis or therapeutic intervention. Interestingly, this creates a cyclical process whereby specific skillsets are most heavily emphasized on the BOC exam and clinical practice, developing confidence and practice silos within these particular domains. Subsequently, the emphasis on specific domains may hinder educational and clinical practice evolution as the health care landscape continues to change (Figure 5).

Figure 5. Cyclical redundancy in learning, knowledge translation, and clinical practice emphases. Abbreviations: AT, athletic trainer.



Our participants also noted that it can be challenging to translate knowledge from didactically taught content to clinical practice. This challenge was previously identified in the literature by preceptors and program faculty.[24] Both faculty and preceptors have struggled to bridge the divide between didactic instruction and real-life clinical practice. As a result, additional efforts may need to be made to address these gaps. It has been previously suggested in medical and nursing education that the inclusion of activities which link clinical practice to the content taught in the classroom, such as simulations, patient cases, or grand rounds, can improve this barrier to knowledge translation.[8,24–26] However, it should be noted that the provision of simulation alone is unlikely to promote significant changes in knowledge translation, and neither will isolated didactic exposure to the content. Farkas et al[27] proposed that the 4E framework, which promotes a hierarchical pipeline from knowledge exposure to embedded use in clinical practice, will likely need to be implemented in education. After exposure to knowledge, experience to increase knowledge or attitudes is the second step of the 4E framework. This is the step that students desire to improve upon their knowledge translation from the classroom to clinical practice.[8,27] This will require both patient- and preceptor-driven strategies to allow for opportunities to implement skills and knowledge that are less frequently seen in traditional athletic training facilities. Preceptor-driven strategies will require preceptors to seek opportunities to expose students to less frequently seen conditions or scenarios. Through a combination of vicarious experience, verbal encouragement, and emotional arousal to promote self-efficacy, preceptors can then use these opportunities to improve students' abilities to translate knowledge outside of the domains of assessment, evaluation, and diagnosis or therapeutic interventions.[17,20] Patient-driven strategies will require purposeful clinical education setting placement on the part of program administrators to ensure students are exposed to not only a wide variety of patients but opportunities to engage in the other domains of practice, such as risk reduction, wellness, and health literacy, critical incident management, and health administration and professional responsibility.[23] Ideally, if these types of strategies for knowledge translation are implemented, it could ultimately break the cycle of siloed emphasis of domains of practice in education and clinical practice.

Stakeholder Relatability

Our participants highlighted that some of the challenges that ultimately inhibit knowledge translation had to do with the inconsistency and incongruency in how concepts were taught. Some identified that the same concepts are taught differently, even between didactic course instructors. Others noted that how specific skills are taught in the classroom is not the same as how their preceptor expected them to perform said skill in clinical practice.

Previous researchers in athletic training have highlighted the gap between what is being taught in the educational pathways of aspiring clinicians compared with established clinicians' practice patterns.[7,9] This challenge has once again been brought to the forefront with the CAATE's release of updated curricular content standards that went into effect for graduate professional programs in 2020.[5] The CAATE included content that previously was not required to be taught in entry-level education, including dislocation reduction, administration of naloxone, performing diagnostic tests, and using biometric data to guide prevention, intervention, and performance enhancement plans.[5] The

quantified time lag between the introduction of new knowledge or skills and the widespread implementation of that information into practices has been estimated to be approximately 17 years.[28] The inclusion of new knowledge and skills in the entry-level preparation of clinicians requires upskilling of the professions' educators and clinicians to ensure that students are appropriately taught and assessed in both the didactic and clinical learning environments. Suppose intentional upskilling does not occur and the profession relies on the typically slow adoption of new information. In that case, we could anticipate widespread inclusion of the curricular content standards' newly introduced skills into the day-to-day practice of athletic training around 2037. The challenge our participants pointed out was that the skills are now required to be taught in professional preparation, but many preceptors have not been taught such skills and, resultingly, are unable to allow students to practice or perform said skills in clinical practice. Additionally, preceptors need to have access to continuing education in curricular content areas, and this effort must be intentional to encourage their inclusion in clinical practice in a timely fashion.

Interestingly, the availability of continuing education in the newly introduced curricular content areas seemingly could create a metachallenge, with preceptors needing to ensure that they not only attend the continuing education but translate the knowledge gained into their own clinical practice to model and facilitate student knowledge translation. Previous researchers have suggested that clinicians primarily select continuing education opportunities that reinforce previously learned content except when forced to select content from specific categories, such as evidence-based practice continuing education.[9,29] Following suit, if a need is present, as suggested by our participants, for the upskilling of preceptors to ensure newly taught content is fully translated to clinical practice, it is possible that continuing education in the new curricular content is needed and may even need to be required by the BOC. This targeted effort would result in an upskilled preceptor force that would be crucial to the knowledge translation efforts of ATSs and newly transitioned athletic trainers.

The existing evidence on role fulfillment among educators and preceptors suggests that increased communication between stakeholder groups can reduce or eliminate some of the challenges that both groups identify relative to translating didactically taught content to clinical experience opportunities. When communication between program faculty and preceptors is effective, frequent, and focuses on students' needs and progression, both faculty and preceptors were able to identify an improved benefit on student development.[7] Thus, we suggest that those responsible for delivering repeated didactic content (across multiple courses within a program) work to increase communication and understanding between parties regarding how content is taught. Additionally, communication between preceptors and program faculty should similarly be improved to facilitate knowledge translation from the classroom to the clinic. One way this could be achieved would be to invite preceptors to participate in courses in which new content is being taught. Students who learn alongside their preceptors may feel more comfortable practicing didactic content in the clinical setting if they know their preceptor was taught the same way to perform a given skill.

Confidence and Growth Mindset

Our participants also identified that one of the challenges they faced in translating knowledge was feelings of discomfort when put in positions in which the knowledge or skills they were taught didactically conflicted with what a preceptor employs clinically. Evidence from the field of nursing has demonstrated that novice clinicians, especially under the supervision of a newly assigned preceptor, struggled with critical thinking because the power dynamic with the supervising preceptor, and the emphasis on task completion, created anxiety. The resulting anxiety was linked to decreased dialog and practice reflection.[30] Similarly, in nursing, research efforts to promote critical thinking among students in clinical rotations identified the need for preceptors to create a space for dialog that encouraged questions, reflection, and critical thinking.[31] Athletic training preceptors should consider how they create space for questions within clinical practice and encourage student dialog, questioning, and critical thinking early on in the clinical rotation. Additionally, the program faculty who provide preceptor training and development should emphasize the need for this space before students are assigned to their sites.

Participants in this study emphasized the duality of confidence and growth mindset and the combined effect of the 2 concepts on their ability to translate knowledge from the classroom to clinical practice. Lacking confidence inhibited their abilities to translate knowledge effectively while possessing confidence promoted knowledge translation. Furthermore, having a growth mindset facilitated students' development of confidence. In research on growth mindset, Duckworth et al[32–34] highlighted that intelligence, while often thought of as the most crucial component to student success, is not the most significant predictor of student success, but rather grit is. *Grit* is a combination of passion and perseverance. Some data from athletic training education literature suggest that students are not given frequent opportunities to perform complex patient encounters while in clinical experiences.[22] It is important to note that this likely suppresses student confidence and growth mindset development, as it limits their exposure to challenging cases and decreases the need to apply critical thinking and decision making during clinical education.

Duckworth et al[32–34] and Dweck[35] have, in their respective work, demonstrated that a students' beliefs about their intellectual abilities are likely to influence their success; if they believe their intelligence is fixed, then when they encounter challenges and setbacks, it is viewed as inevitable and insurmountable. Alternatively, if students believe they can change their abilities and improve upon them, they are more likely to pursue opportunities for growth and make efforts toward change. Duckworth et al[32–34] and Dweck[35] impressed upon their readers that having a growth mindset does require both grit and perseverance but that those monikers are not synonymous with time spent in pursuit of growth. Relating this concept to athletic training education would indicate that students can be coaxed into a growth mindset academically by understanding that they can learn and that a willingness to learn is a far more significant predictor of their success than the summation of knowledge previously learned. This is especially pertinent to knowledge translation in the clinical setting when preceptors create the aforementioned space for questions and critical thinking, thus encouraging a growth mindset and potential confidence within the students they are precepting. To best promote knowledge translation among ATSs, preceptors must create a space that encourages student questioning. Both educators and preceptors need to reinforce to students their unlimited learning capacity rather than emphasizing previously demonstrated intellectual abilities.

Establishing a growth mindset among students will strengthen confidence in their abilities and likely increase knowledge translation of didactically taught content to clinical practice.

Limitations

The voluntary nature of survey research presents an inherent limitation related to self-selection. Since participants were not required to respond to every survey item, it is possible they only responded to items they felt comfortable with or were knowledgeable about. To minimize this potential limitation, we only included responses from participants that answered all open-ended questions to ensure we gained a complete perspective of each participant's view regarding the topic. Additionally, researcher bias was another potential limitation due to the textual nature of the data. To minimize this limitation, we used a rigorous, multiphase data analysis approach that required consensus to be met at each phase by a multiperson research team.[13,14] We also included an auditor to review the data and ensure that the participant voice was well represented. In our research, we aimed to understand ATSs' perceptions of knowledge translation. To ensure participants responded organically to each survey item, we did not provide them with an operational definition of knowledge translation. Still, when warranted, we did encourage the inclusion of examples to support their responses to each item.

Additionally, while it was essential to understand all ATSs' perceptions of knowledge translation, we recognize some inherent limitations to our sampling pool. First, we did not delimit our sample to only ATSs from professional graduate programs. Since knowledge translation is an iterative process, we did not believe the type of program would influence students' perceptions of the concepts. Additionally, both program types were viable options for degree completion at the time of this study. Now that professional education has transitioned to the graduate level, further investigation regarding ATSs' perceptions of knowledge translation may be warranted. Secondly, we recruited all professional ATSs to participate in this study, regardless of how many semesters they had completed at the time of data collection. It is possible that participants' perceptions of knowledge translation were influenced by the opportunities or lack of opportunities they had during clinical experiences depending on their progression within the program at the time of data collection. Students further along in the professional ATP may have inherently had more opportunities or hands-on exposures to help facilitate knowledge translation, while students in the beginning phases of the program may not. This scenario could have influenced how students responded to the survey items. Therefore, further research is necessary to explore the knowledge translation experiences of final-term ATSs to better conceptualize which influencing factors positively or negatively affect their opportunity to translate knowledge gained from the classroom into clinical practice.

CONCLUSIONS

Findings from our study suggest that, based on students' perceptions, the knowledge they translate from the classroom to clinical practice may be based more on circumstance and the influences of others (ie, preceptors, patients) than an intentional action. Students highlighted a disconnect between what was taught in the classroom and what was experienced during clinical education opportunities, which left students with uncertainty about which information was important and meaningful for clinical practice. They also expressed concern that the information taught in the classroom was often not modeled by preceptors during clinical experiences or not accepted by their preceptors as relevant to contemporary athletic training practice, further exacerbating their uncertainty. Positive attitudes about the information gained are central to successful knowledge translation.[8,27] Therefore, if the information students are taught in the classroom is not being modeled by preceptors or is not viewed favorably by preceptors as a realistic component of clinical practice, it is unsurprising that students may be less likely to translate that knowledge or skill into their practice.

While these findings only consider students' perceptions of their experiences and do not account for what may be occurring, more intentional focus to promote synergy between faculty and preceptors may be warranted to ensure the information taught didactically is well aligned with what students are encountering during clinical experiences. Furthermore, implementing established knowledge translation models, such as the 4E Framework,[27] may be beneficial to ensure students are not only exposed to new knowledge and skills but are regularly encountering intentional experiences to increase their competence and self-efficacy of the content over time.

REFERENCES

1. About us. Canadian Institutes of Health Research. Published July 28, 2016. Accessed August 12, 2020. http://www.cihr-irsc.gc.ca/e/29418.html
2. Menear M, Grindrod K, Clouston K, Norton P, Légaré F. Advancing knowledge translation in primary care. *Can Fam Physician*. 2012;58(6):623–627.
3. Wyllie G, French E, Dodd N, Lee Y, Honey M. How to bridge the theory-to-practice gap. *Kai Tiaki Nurs New Zealand*. 2020;26(1):22–23.
4. Gallagher P. How the metaphor of a gap between theory and practice has influenced nursing education. *Nurse Educ Today*. 2004;24(4):263–268.
5. Standards for the accreditation of professional athletic training programs. Commission on Accreditation of Athletic Training Education (CAATE). Published 2020. Accessed August 12, 2020. https://caate.net/pp-standards/
6. Streveler MJ. *Students' Perception of a Theory-Practice Gap in Athletic Training Education*. Doctor of Education. University of Minnesota; 2013.
7. Cavallario JM, Cohen GW, Wathen HBM, Nelson EL, Welch Bacon CE. Faculty and preceptor perceptions of their respective roles in athletic training student development. *Athl Train Educ J*. 2021;16(3):208–218.
8. Welch Bacon CE, Pike Lacy AM, Lam KC. Knowledge translation in athletic training: considerations for bridging the knowledge-to-practice gap. *J Athl Train*. 2021;56(11):1165–1172.
9. Welch CE, Hankemeier DA, Wyant AL, Hays DG, Pitney WA, Van Lunen BL. Future directions of evidence-based practice in athletic training: perceived strategies to enhance the use of evidence-based practice. *J Athl Train*. 2014;49(2):234–244.
10. Williams RM, Welch CE, Parsons JT, Valovich McLeod TC. Athletic trainers' familiarity with and perceptions of academic accommodations in secondary school athletes after sport-related concussion. *J Athl Train*. 2015;50(3):262–269.

11. The Belmont Report. Office for Human Research Protections (OHRP). Accessed March 18, 2022. https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html
12. Decieux JP, Mergener A, Neufang KM, Sischka P. Implementation of the forced answering option within online surveys: do higher item response rates come at the expense of participation and answer quality? *Psihologija*. 2015;48(4):311–326.
13. Hill CE, Thompson BJ, Williams EN. A guide to conducting consensual qualitative research. *Couns Psychol*. 1997;25(4):517–572.
14. Hill CE, Knox S, Thompson BJ, Williams EN, Hess SA, Ladany N. Consensual qualitative research: an update. *J Couns Psychol*. 2005;52(2):196–205.
15. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349–357.
16. Practice analysis. Board of Certification. Accessed September 9, 2022. https://bocatc.org/athletic-trainers/practice-analysis
17. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev*. 1977;84(2):191–215.
18. Straus SE, Tetroe J, Graham I. Defining knowledge translation. *CMAJ*. 2009;181(3–4):165–168.
19. Carr WD, Volberding JL. Exploring gender and self-efficacy ratings of athletic training students over time. *Athl Train Educ J*. 2014;9(3):127–134.
20. Schunk DH. Self-fffficacy and academic motivation. *Educ Psychol*. 1991;26(3–4):207–231.
21. Pajares F. Self-efficacy beliefs in academic settings. *Rev Educ Res*. 1996;66(4):543–578.
22. Welch Bacon CE, Cavallario JM, Walker SE, Bay RC, Van Lunen BL. Characteristics of patient encounters for athletic training students during clinical education: a report from the AATE Research Network. *J Athl Train*. 2022;57(7):640–649. doi:10.4085/1062-6050-526-21
23. Board of Certification for the Athletic Trainer. *Content Outline for Practice Analysis, 8th Edition*.; 2022. https://bocatc.org/system/document_versions/versions/276/original/boc-pa8-content-outline-20211228.pdf?1640719357
24. Cavallario JM, Cohen GW, Wathen HBM, Nelson EL, Welch Bacon CE. Faculty and preceptor perceptions of their respective roles in athletic training student development. *Athl Train Educ J*. 2021;16(3):208–218.
25. Peters S, Clarebout G, Diemers A, et al. Enhancing the connection between the classroom and the clinical workplace: a systematic review. *Perspect Med Educ*. 2017;6(3):148–157.
26. Jamshidi L. The challenges of clinical teaching in nursing skills and lifelong learning from the standpoint of nursing students and educators. *Procedia Soc Behav Sci*. 2012;46:3335–3338.
27. Farkas M, Jette AM, Tennstedt S, Haley SM, Quinn V. Knowledge dissemination and utilization in gerontology: an organizing framework. *Gerontologist*. 2003;43 Spec No 1:47–56.
28. Morris ZS, Wooding S, Grant J. The answer is 17 years, what is the question: understanding time lags in translational research. *J R Soc Med*. 2011;104(12):510–520.
29. Edler JR, Eberman LE. Factors influencing athletic trainers' professional development through continuing education. *Athl Train Educ J*. 2019;14(1):12–23.
30. Forneris SG, Peden-McAlpine C. Evaluation of a reflective learning intervention to improve critical thinking in novice nurses. *J Adv Nurs*. 2007;57(4):410–421.
31. Forneris SG, Peden-McAlpine C. Creating context for critical thinking in practice: the role of the preceptor. *J Adv Nurs*. 2009;65(8):1715–1724.
32. Duckworth AL, Peterson C, Matthews MD, Kelly DR. Grit: perseverance and passion for long-term goals. *J Pers Soc Psychol*. 2007;92(6):1087–1101.
33. Duckworth AL, Quinn PD. Development and validation of the Short Grit Scale (Grit–S). *J Pers Assess*. 2009;91(2):166–174.
34. Duckworth AL, Quinn PD, Lynam DR, Loeber R, Stouthamer-Loeber M. Role of test motivation in intelligence testing. *Proc Natl Acad Sci U S A*. 2011;108(19):7716–7720.
35. Dweck CS. *Mindset: The New Psychology of Success*. Random House Publishing Group; 2006.