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SURVEY

# Reflective Thinking in Athletic Training Students

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**Context:** Athletic training students, part of the broader healthcare system, are expected to maintain knowledge and skill levels, including reflection. Once graduated, students need to continuously evaluate themselves as clinicians, thus requiring some skill in reflecting at different levels.

**Objective:** To examine athletic training students' level of reflective thinking in academic programs.

**Design:** Cross-sectional study.

**Setting:** Web-based survey.

**Patients or Other Participants:** Athletic training students ($N = 126$) currently enrolled in professional bachelor's, professional master's, postprofessional master's, clinical doctorate, research doctorate, or residency/fellowship programs.

**Data Collection and Analysis:** Participants rated the 16-item Likert-style Reflective Thinking Survey on their experiences in their current program. The items were subdivided into 4 subscales: habitual action, understanding, reflection, and critical reflection. We used the Kruskal-Wallis test to assess individual items against participants' current academic programs, followed by Mann-Whitney *U* post hoc tests due to nonnormality.

**Results:** We found differences between "In this course, we do things so many times that I started doing them without thinking about it" ($H_4 = 21.79$, $P < .001$) and "This course has challenged some of my firmly held ideas" ($H_4 = 15.83$, $P = .003$). Post hoc analysis showed differences on "...do things so many times...without thinking..." between professional bachelor's and postprofessional master's students ($U = 20.50$, $P = .001$), professional bachelor's and clinical doctorate students ($U = 135.0$, $P = .003$), and professional master's and postprofessional master's students ($U = 56.5$, $P < .001$). Differences were found between professional bachelor's and clinical doctorate students ($U = 131.0$, $P = .003$) and between professional master's and clinical doctorate students ($U = 158.0$, $P < .001$) on the item "...challenged some of my firmly held ideas."

**Conclusions:** Professional-level students reflected more on firmly held ideas, indicating more challenge with new knowledge exposure. Educators should, themselves, reflect on their goals when evaluating for a certain level of reflection and consider their program's overall goals for preparing future and current athletic training students for practice.

**Key Words:** Education, reflection, clinical practice

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# Reflective Thinking in Athletic Training Students

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## KEY POINTS

- Professional-level athletic training students seem to engage in less habitual action reflection.
- Doctorate students may not have their firmly held ideas challenged during the course of their programs.
- Critical reflection is a powerful experience; educators can keep this as an end goal in mind for learning opportunities such as simulations and debriefs.
- Educators should tailor activities, courses, and programs to the type of reflection they seek to cultivate in students.

## INTRODUCTION

As the profession of athletic training has evolved and moved from the locker room to a variety of health care facilities, so has the need for athletic trainers (ATs) to remain keenly aware of changes in health care policy and practice.[1] With the advent of continuous improvement initiatives and faster research publishing timelines, the need for health care providers to integrate new knowledge or practices quickly has never been higher. An approach theorized to help with such tasks is reflection.[2,3] This article will describe several such approaches generally and 1 framework in particular. Based on the theories of Donald Schön, John Dewey, Jack Mezirow, and other scholars since, reflection presents several ways to engage with knowledge and experiences with the overall goal of changing or improving a thought process or skill.[4–8] Reflection is a sought-after, valued skill in the fast-moving health care industry.[9,10] Core skills, such as clinical reasoning,[11–13] diagnostic competency,[14–16] and self-awareness,[17–19] are connected to and enhanced in health care and athletic training through reflective practices. How we prepare preprofessionals to practice matters; intentionally including reflective approaches in our programs allows us to plant the seeds for reflective practice and encourage the development of valuable clinical and social skills in professional-level students and refine such skills in already-practicing clinicians through professional development.

### Critical Reflection

A variety of reflection theories exist including those developed by Dewey and Schön, who began building on the idea of reflection and incorporating the practice of reflection into work in the early and later 20th century, respectively.[4–7] Dewey began writing about reflection as a skill wherein a practitioner could engage in "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends [that] constitutes reflective thought."[20] Schön took the concept of reflection beyond active, focused thinking on a particular subject, expanding the idea into 2 categories: reflection-in-action and reflection-on-action.[7] Reflection-in-action is defined as "thinking about something while doing it," and reflection-on-action is looking back at a situation and trying to make sense of it.[4]

Mezirow's theory of transformative learning is based on the work of Dewey and focuses on how adults make sense of their life experiences. We will define some key terms to provide context to the presentation of critical reflection. Mezirow describes 3 types of meaning structures that build upon each other and are crucial to understanding how we, as educators and clinicians, can foster critical reflection in students and ourselves. We start with a frame of reference, which is described as the "structures of assumptions and expectations on which our thoughts, feelings, and habits are based."[21] Within the frame of reference, we have 2 further concepts: habits of mind and points of view. Habits of mind are the way each person sees the world based on their own experiences, background, culture, etc. The point of view is the expressed habit of mind.[22] It is made of meaning schemes, which are "sets of immediate, specific beliefs, feelings, attitudes, and value judgments"[21,23]; a point of view is more easily changed than the habit of mind that informs it. Finally, we have a perspective shift or transformation, a result of changing or transforming a habit of mind.[22]

In transformative learning, there are 4 components of the learning process we will focus on, although the full theory contains 10 steps.[22] We will focus on experience, critical reflection, reflective discourse, and action. Experience is self-explanatory; as we move through life and our work, we collect experiences that inform our habits of mind and points of view. At some point, we may encounter experiences that challenge 1 or both of those concepts, and critical reflection becomes necessary. The reflection results in a perspective transformation. We will return to reflection in general and critical reflection specifically later. Following critical reflection, adults often need to test the new meaning schemes growing from the critical reflection, ergo reflective discourse. During this component of transformative learning, adults will discuss or seek out differing points of view and interrogate evidence for or against the new meaning. The discourse is not an individual activity nor is it a debate with differing views; educators encourage empathic understanding in students. Creating a shift in a habit of mind or point of view and ending with a changed meaning perspective typically requires a high level of emotional intelligence to question one's deepest held beliefs and to participate in the discussion of the process of transformation with someone during said transformation.[22] In the end, we are left with taking action based on the perspective transformation or the meaning perspective change. Action may be anything from changing the point of view (expressed habit of mind) to engaging with new communities or political groups. Mezirow's transformative learning theory focuses on social change as a result of adult learning[22]; the framework of engaging in critical reflection and reflective discourse and then taking action may be transferred to other areas of adult learning or applied to work scenarios as well.

Returning to reflection and critical reflection, Mezirow built on Dewey's reflection theory by further dividing the core concept into reflective versus nonreflective action.[24] Nonreflective action was again subdivided into several types: habitual action and thoughtful action.[24] Habitual action is running on

**Table 1. Reflective Thinking Survey[a]**

| |
|---|
| 1. When I am working on some activities, I can do them without thinking about what I am doing. |
| 2. This **program** requires us to understand concepts taught by the lecturer. |
| 3. I sometimes question the way others do something and try to think of a better way. |
| 4. As a result of this **program**, I have changed the way I look at myself. |
| 5. In this **program**, we do things so many times that I started doing them without thinking about it. |
| 6. To pass this **program**, you need to understand the content. |
| 7. I like to think over what I have been doing and consider alternative ways of doing it. |
| 8. This **program** has challenged some of my firmly held ideas. |
| 9. As long as I can remember handout material for examinations, I do not have to think too much. |
| 10. I need to understand the material taught by the **faculty** in order to perform practical tasks. |
| 11. I often reflect on my actions to see whether I could have improved on what I did. |
| 12. As a result of this **program**, I have changed my normal way of doing things. |
| 13. If I follow what the **faculty** says, I do not have to think too much on this **program**. |
| 14. In this **program**, you have to continually think about the material you are being taught. |
| 15. I often reappraise my experience so I can learn from it and improve for my next performance. |
| 16. During this **program**, I discovered faults in what I had previously believed to be right. |

[a] Bolded words are changed from the original study to better match the purpose of this study. Adapted from Kember et al.[8]

autopilot; little reflection on the actions is required. It can also be found in the literature described as "knowing-in-action," differentiating it from "reflection-in-action" by the metacognitive properties associated with thinking about the action versus simply doing it. In the context of athletic training, this could be performing a routine task such as preparing a team for practice or completing an on-field evaluation with little thought about the process in the moment.

Thoughtful action, or understanding, uses the knowledge within its learned context and does little to translate the knowledge beyond it. The foundational knowledge required by the 2020 Commission on Accreditation of Athletic Training Education Standards,[25] "book learning," can be found in this level of reflection. Learners comprehend the knowledge but do not appraise it or attempt to move it beyond the learned context. Additionally, thoughtful action may be considered any action that is not habitual, wherein someone is using their previous experiences and knowledge to guide their action.

Reflective action is subdivided into 2 levels: content and process reflection, the lower or less critical level, and critical reflection.[24] Each of these sublevels explores a different type of "reflection" or action associated with reflective practice. Content and process reflection are thinking deeply about what has been learned, whereas process reflection focuses more on how the content was learned. The final level, premise or critical reflection, requires a deeper examination of a person's values and internal questioning of action.[24] It asks "why?" about how a problem has been posed, requires an examination of values and habits of mind, and results in a meaning perspective change. Changing a meaning perspective, as is required to engage in critical reflection, asks the learner to examine long-held beliefs picked up through previous experiences, particularly childhood, and that have not been critically examined.

Based on these theories, a large library of literature has been established about using the concept of reflection and reflective practice in professional, clinical, and educational settings. Reflection theory has, thus, been used as a tool to foster many different skills in different disciplines, yet 1 thing remains clear: it is a skill. As such, "being good" at reflecting is not necessarily an inherent quality; it must be practiced. One way to track practice and improvement is via instruments given to students or practitioners.

The Reflective Thinking Survey (RTS; also noted in the literature as the Reflective Questionnaire[26,27] or Reflective Thinking Questionnaire)[27] is a validated survey that examines a participant's reflective thinking in 4 subscales: habitual action, understanding, reflection, and critical reflection (Table 1).[8,27] Athletic training students engaged in didactic and clinical work require reflection to integrate the new knowledge into their already existing knowledge. They are also creating new behavior patterns in relation to applying said knowledge in their clinical experiences, similar to practices used in nursing.[13] The way students engage in reflection may change depending on a variety of factors, including the type of education in which they are currently enrolled as well as their previous education, experience, and age. ATs operate within the US health care system, where implementation of evidence can take up to 17 years[28,29] and processes and expectations change quickly. Being able to reflect, even if every reflection does not reach the level of critical reflection and perspective transformation, is an important skill to support navigation of such a system. With ever-expanding postprofessional education opportunities for ATs, the need to understand how, when, and what kinds of reflection AT students and certified ATs engage in is paramount. It is helpful to understand how future and current ATs are trained and socialized into reflection so educators can provide them with the skills necessary to manage an unpredictable job market and their own professional development. In extensive review for this article and other works, little literature has been seen to focus directly on measuring athletic training students' or clinicians' levels of reflection.

The purpose of this project was to examine athletic training students' level of reflective thinking in their academic programs. The hypothesis was that the means for each item would increase as the program terminality increased; for example, clinical doctorate (DAT) students would have higher means in the critical reflection subcategory than a professional bachelor's (PB) student.

## METHODS

### Design

We used a cross-sectional survey research design to explore athletic training students' level of reflection in their educational programs. This study was approved as exempt research by the university's institutional review board due to the type of data collected.

### Participants

We recruited athletic training students enrolled in the following athletic training programs: PB, professional master's (PM), postprofessional master's (PPM), DAT, research doctorate, and/or residency/fellowship programs. We defined athletic training students as any student at any level enrolled within a labeled athletic training program. We did not specify if the athletic training student needed to be certified or not. Because athletic training students' contact information is not publicly available, participants were recruited through their program directors, who were listed on the Commission on Accreditation of Athletic Training Education website.

### Instrumentation

We searched the literature for validated and reliable surveys measuring reflective capacity or level in health care professions students. There are no athletic training-specific reflection surveys available.[27] The RTS is a 16-item questionnaire developed based on Mezirow's framework for assessment of reflective thinking. Two types of reflection, descending from Schön and Dewey's[7] works on reflective practice, include reflective action and nonreflective action, each of which has 2 scales in the RTS dedicated to it.[8] The scales in the RTS associated with Mezirow's levels connect habitual action and understanding (RTS scales) with nonaction reflection and connect reflection and critical reflection with reflective action.[8,30] Each level builds on the previous level, indicating an increasing depth of reflection, culminating in the final level of critical reflection. Critical reflection is considered to be a rare event, although this type of reflection is the deepest, most critical on the scale. The internal consistency measures for the instrument are reported for each of the 4 subscales in the RTS (habitual action, understanding, reflection, and critical reflection) and range from 0.58 to 0.85.[8,31,32] Confirmatory factor analysis was also used to establish validity; the intended factor structure was shown with a comparative fit index ($\chi^2 = 179.3$, $df = 100$, comparative fit index = 0.903).[26,31]

Scoring for the RTS is completed by assigning a 5 as *definitely agree* and 1 as *definitely disagree*, with the rest of the Likert scale being graded accordingly.[8] The Likert scale included labels for the following: *definitely agree* (5), *agree with reservation* (4), *only to be used if a definite answer is not possible* (3), *disagree with reservation* (2), and *definitely disagree* (1). The use of "with reservation" on both the agree and disagree sides provides participants with an option similar to "mostly" agree or disagree, wherein they can use their judgment to include gray areas of the question rather than having to choose between fully agreeing or disagreeing. Individual scores are collected on each subscale and may be added together to create a subscale sum.

### Procedure

We accessed each program's institution page from the Commission on Accreditation of Athletic Training Education webpage listing every AT program in the United States. Program directors' email addresses were then collected from their individual institutions' websites; for those program directors whose emails were not listed but an email form was available, the form was used. Three hundred and twenty-eight program directors were asked to forward the recruitment email and survey link to their students for completion; 7 program director emails bounced, and 3 failed, resulting in 318 emails sent via Qualtrics or institutional forms. The program director email included the purpose of the study, estimated time of completion, and a request to forward the recruitment email and informed consent information to their enrolled students. The principal investigator (Shannon Wright) also posted a graphic and informational paragraph on her personal social media and the Women in Athletic Training Facebook group. Social media recruitment was posted once on each page.

Program directors were emailed initially, a reminder was sent 2 weeks later, and a final email was sent the week before data collection closed. The data collection period was 5 weeks long during the spring of 2022.

### Statistical Analysis

The survey data were analyzed using SPSS (version 28; IBM Corp). Due to the nonnormality of the data (Shapiro-Wilk test, $P \leq .001$), we used nonparametric statistics (Kruskal-Wallis tests) to analyze the individual Likert scale responses by current academic program. Afterward, we ran Mann-Whitney $U$ post hoc tests to explore where the specific differences were between academic programs on the individual items. The $\alpha$ level of significance was set at $P < .05$.

## RESULTS

A total of 126 participants completed the survey. The participants ranged in age from 20 to 42 years old. Thirty-four participants identified as men, 91 identified as women, and 1 identified as nonbinary/third gender. Twenty-seven of the 126 participants were certified ATs. PB and PM program students accounted for 38 and 60 participants, respectively. No participants were completing research doctorate programs, whereas 7 were enrolled in PPM programs, 14 were enrolled in DAT programs, and 7 were enrolled in residency programs.

We used a Kruskal-Wallis test to assess individual survey items against the participants' current academic program and found differences between "In this program, we do things so many times that I started doing them without thinking about it" ($H_4 = 21.79$, $P < .001$) and "This program has challenged some of my firmly held ideas" ($H_4 = 15.83$, $P = .003$). Post hoc analysis showed differences on "...we do things so many times that I started doing them without thinking about it" between PB ($n = 38$, mean rank = 20.04) and PPM students ($n = 7$, mean rank = 39.07, $U = 20.50$, $P < .001$, $r = 0.6$), between PB ($n = 38$, mean rank = 23.05) and DAT students ($n = 14$, mean rank = 35.86, $U = 135.0$, $P = .003$, $r = 0.4$), and between PM ($n = 60$, mean rank = 31.44) and PPM students ($n = 7$, mean rank = 55.93, $U = 56.5$, $P < .001$, $r = 0.4$). Post hoc analysis showed differences on "This course has

**Table 2. Item 5 ("In This Program, We Do Things So Many Times That I Started Doing Them Without Thinking About It") Likert Responses by Current Academic Program**

| Current Academic Program | Likert Scale Item, No. (%) | | | | | |
|---|---|---|---|---|---|---|
| | *Definitely Disagree* (1) | *Disagree With Reservation* (2) | *Only to Be Used If a Definite Answer Is Not Possible* (3) | *Agree With Reservation* (4) | *Definitely Agree* (5) | Total |
| Professional bachelor's | 15 (39.5) | 18 (47.3) | 3 (7.9) | 2 (5.3) | 0 | 38 |
| Professional master's | 16 (26.7) | 32 (53.3) | 2 (3.3) | 9 (15) | 2 (3.3) | 60 |
| Postprofessional master's | 0 | 1 (14.3) | 1 (14.3) | 2 (28.8) | 1 (14.3) | 7 |
| Clinical doctorate | 0 | 9 (64.3) | 2 (14.3) | 2 (14.3) | 1 (7.1) | 14 |
| Residency | 3 (42.3) | 3 (42.3) | 0 | 1 (14.3) | 0 | 7 |
| Total | 34 (27) | 63 (50) | 8 (6.3) | 17 (13.5) | 4 (3.2) | 126 |

challenged some of my firmly held ideas" between PB ($n = 38$, mean rank = 30.05) and DAT students ($n = 14$, mean rank = 16.86, $U = 131.0$, $P = .003$, $r = 0.4$) and between PM ($n = 60$, mean rank = 41.87) and DAT students ($n = 14$, mean rank = 18.79, $U = 158.0$, $P < .001$, $r = 0.4$).

## DISCUSSION

Reflection is a skill that develops over time and with practice,[4] as many other skills do. To engage with deeper types of reflection, students must be prompted and taught how to do so.[33] This study aimed to examine what level of reflection athletic training students in a variety of programs engaged in over the course of their academic program. We predicted that athletic training students enrolled in higher-level academic programs would be engaging in the deeper types of reflection (reflection and critical reflection) on a regular basis. In fact, close to the opposite was found in some of the results while other findings supported the hypothesis.

Further breaking down the survey, differences were noted between 2 items for professional-level programs (PB and PM) and postprofessional programs (PPM and DAT), with the results revealing the opposite effects of our hypothesis for 1 of the items. The first item with statistically significant differences was "In this program, we do things so many times that I started doing them without thinking about it." PPM students more often agree with reservation that their programs increase habitual repetition and action than students enrolled in PB programs, who disagree with reservation (Table 2). PPM students also agree with reservation that their programs increase habitual repetition compared with PM students, who disagree with reservation more than other categories. DAT students tend to agree more than PB students that their programs do things so many times that they start doing them without thinking about them; however, in the Likert breakdown, both program groups are clustered in the disagree portion of the scale, indicating that although DAT students agree with the statement more, they still disagree with reservation that their programs do this.

Postprofessional students (PPM and DAT) typically have more educational and practical experience than PB and PM students; therefore, their postprofessional programs may be reinforcing habits, skills, and ideas already held by these students. However, DAT students were clustered in the "disagree with reservation" choice in the Likert scale, indicating that they did not think that they practiced skills enough to become habit. The survey leaves no space for exploring whether the DAT students were thinking of new skills or previously learned skills when completing it. Another consideration is that professional-level students are usually not exposed to the detailed content needed to practice as an AT until they are in their program. Postprofessional-level students have, presumably, already completed a professional degree (2 or 3 years) and have been practicing, leading to more habitual practices.

Habitual practices in this context relates to habitual reflection, acting from habit rather than engaging in any deeper reflection of the action. In the literature, some researchers have found that medical professionals use mental tools such as "illness scripts," internal referencing and matching systems to recognize illness symptom patterns, in their practices.[16,34] Such tools may commonly require less frequent reflection as the illness scripts become habit. Other skills may also become habit in similar ways, leading to habitual reflection and practice. Finally, the length of programs and time spent on skill acquisition may account for the lower ratings on this item. Most AT professional programs are moving from a 3-year model (PB) to a 2-year model (PM). A major driving factor in professional-level programs is competence following graduation, requiring a basic level of understanding and application that may not leave as much room for developing habitual practice.

The second item with statistically significant differences was "This program has challenged some of my firmly held ideas." DAT students definitely disagree more that the program challenges some of their firmly held ideas than students enrolled in PB and PM programs, who both disagree with reservation more than other categories (Table 3). The results suggest that only DAT students firmly disagree with the statement. Professional-level students also disagree but to a lesser extent than the DAT students. Students enrolled in professional-level programs may have firmly entrenched ideas that need dismantling over the course of the program. On the other hand, DAT students may not enroll in their programs to find new ideas related to the field but to gain new or broader skill sets to set themselves apart.

With little research available on reflection in the field of athletic training or in athletic training education, we must look to other professions to cast light on how the results of this study matter in the profession and the broader landscape of health care education. The deviations in results may be, in part, due to populations examined in each study and may also

**Table 3. Item 8 ("This Program Has Challenged Some of My Firmly Held Ideas") Likert Responses by Current Academic Program**

| Current Academic Program | Likert Scale Item, No. (%) | | | | | Total |
|---|---|---|---|---|---|---|
| | *Definitely Disagree* (1) | *Disagree With Reservation* (2) | *Only to Be Used If a Definite Answer Is Not Possible* (3) | *Agree With Reservation* (4) | *Definitely Agree* (5) | |
| Professional bachelor's | 11 (28.9) | 16 (42) | 5 (13) | 5 (13) | 1 (2.6) | 38 |
| Professional master's | 12 (20) | 25 (41.7) | 8 (13.3) | 14 (23.3) | 1 (1.7) | 60 |
| Postprofessional master's | 3 (42.9) | 3 (42.9) | 1 (14.3) | 0 | 0 | 7 |
| Clinical doctorate | 10 (71.4) | 4 (28.6) | 0 | 0 | 0 | 14 |
| Residency | 3 (42.9) | 1 (14.3) | 0 | 3 (42.9) | 0 | 7 |
| Total | 39 (31) | 49 (38.9) | 14 (11.1) | 22 (17.5) | 2 (1.6) | 126 |

be due to the structure of the courses and programs. Another contributing factor, identified in Kember et al's original manuscript, is the concept of critical reflection entailing a major change of perspective as well as change to deep-seated beliefs.[8] To achieve this level of reflection typically takes extensive time and may or may not be a painful process of change. Again, the purpose of attending a postprofessional program in AT may not be to have deeply seated beliefs challenged but to gain new skills. Such motivation may result in less critical reflection and more enforcement of existing skills as well as varying levels of understanding and reflection as new skills move into the habitual action category. However, if a goal of a program is to challenge those deeply held beliefs in students, educators can design learning opportunities and safe reflection environments to encourage critical reflection in students. It cannot be guaranteed for students to change their beliefs in a program because critical reflection requires examining their habits of mind, but educators can encourage and model the skills required as well as create experiences to promote critical reflection.

Few studies examine the use of the RTS in the United States, although there are other processes available to evaluate reflection in education.[26,27] Many of the other processes are surveys or rubrics meant to assess reflective writing within an educational course or program rather than assigning levels of reflection to students. Each has its purpose depending on the intent of the evaluation.[27] In most studies examining reflection from the theoretical construct informing the RTS, Mezirow's theories are the basis to develop either similar questionnaires to the RTS or written reflection evaluation criteria.[27] One study in Australia used the RTS as a base for developing a specific tool for research relating to reflection and high-fidelity simulations in nursing.[32] Others have also commented on the use of reflection in education.[35]

Specifically focusing on reflection in context for the athletic training profession and AT education, we will pivot to discuss why the assessment of reflection depth is important for AT education and professional development. To prepare professional-level AT students to engage with the health care system (PB and PM), educators may be attempting to promote reflection as part of the health care provider skillset. To instill the level of reflection needed for appropriate professional development and overall self-awareness as a clinician, educators must consider how students are reflecting and what level of reflection they already use in the appropriate context.

Critical reflection may not be as achievable in education programs as educators would like based on the nature of the definitions of Kember et al,[8] Mezirow,[24] and Dewey.[7] The concepts of critical reflection, premise reflection, etc require a deep reordering and examination of beliefs and the self-awareness to assess and change them.[8] The rarity of such experiences may limit the opportunities for students to practice critical reflection in the short time span offered with clinical education experience hours. However, educators may take the general structure of transformative learning theory and incorporate it into those learning opportunities where they want to promote critical reflection.[22] Educators curate an experience, like a simulation or standardized patient, and provide the space and guidance for critically examining deeply seated beliefs, which may be touched on during the activity. After the reflection period, they may provide a space for reflective discourse, that is, debriefing the experience, before asking students to take action based on their reflections. An important part of preparing such an experience for students is to encourage them to be open to others' perspectives and provide the space for the same experience to be examined through various points of view.[36] Other strategies that may help foster critical reflection, with the appropriate guidance from instructors, include guest speakers who have practiced critical reflection, role play scenarios, practicing crisis responses, and soft skills like delivering bad news, case studies, and examples of how critical reflection is used in "real life" by practicing clinicians. Regardless of the program's reflection goals for students, the structure presented in transformative learning theory may also help promote routine reflection; educators can use the same ideas to create those experiences and prompts for less life-changing mental and emotional reordering.

Reflective practices also present a path to improving other skills in AT and other health care professions. Reflection has direct and indirect effects on clinical skills such as clinical reasoning,[11–13,37] diagnostic competency,[14–16] and self-awareness.[17–19] It may also help with processing difficult emotions and situations that arise in the practice of AT, as shown in nursing literature.[17] The above results of reflection are a result of the more routine reflection, still resulting in transformation, but transformation of the straightforward kind rather than the profound, deep transformation stemming from critical reflection. The current study provides insight into what types of reflection students perceive to be happening in their academic program; educators may find the use of the RTS useful as feedback to hear what current students think. It may be a useful tool for program administrators to implement the same questionnaire to assess reflection as a program outcome. It is possible graduates of programs may have different perceptions of the programs' reflection promotion after some time has passed. The study

asked currently enrolled students about their experiences but not graduates of programs.

The current study poses limitations, including having surveyed students at 1 time during their education in their particular program rather than throughout or bracketing the program's beginning and end. As with most surveys, the data may be biased toward athletic training students who were willing to complete a survey. The wording of the survey was slightly altered on items to reflect the program versus a singular course, as was done in the original study.[8] Such a change broadens the context of the survey rather than focus on 1 course or skillset. Finally, most participants in the current study were students enrolled in PB programs; such programs are being phased out by 2026, and so the results may not be generalizable to PM-level students in the future.

Future research on reflection in athletic training should include examining levels of reflection across practicing ATs as well as effects of educational interventions on the level of reflection achieved by students. Other considerations on reflection research in athletic training include potentially using other means of reflection assessment and what reflective practices may be most effective in which circumstances for ATs.

Reflection can be a difficult skill to assess[27] yet is becoming an expected skill and potentially an expected competency in health care fields.[35,38] The current study explored perceived reflection levels in athletic training students across a variety of academic programs and found that postprofessional AT students are more likely to continue reinforcing habitual practices in their programs than professional-level students. Most students, professional and postprofessional, did not perceive their programs to change their deeply held beliefs during the program. Educators should consider asking graduates about their reflection experiences sometime after they finish a program to assess if students think critical reflection is taking place during the program. The impact of these findings may indicate that programs readjust their stance on reflection as a skill and reflect on the best way to promote and assess reflective practice as an essential part of being a clinician. Educators may be best served by focusing on what kind of reflection they want to promote with specific learning opportunities. Critical reflection is an important skill and experience for students to have, but it may not always be the appropriate level of reflection. They have the capability to create meaningful, powerful learning opportunities where reflection may take place. With the ever-changing health care field, ATs must be prepared by their educational programs to reflect at the various levels when circumstances dictate.

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