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## Preparing Students for the National Physical Therapist Examination (NPTE): One Program's Experience with Using the Practice Exam and Assessment Tool (PEAT) as a Graduation Requirement

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## Preparing Students for the National Physical Therapist Examination (NPTE): One Program's Experience with Using the Practice Exam and Assessment Tool (PEAT) as a Graduation Requirement

### Abstract

**Purpose.** Factors related to National Physical Therapist Examination (NPTE) performance have been widely reported in the literature, yet no strong predictors emerge offering faculty guidance on how to determine student readiness for the NPTE. The Practice Exam and Assessment Tool (PEAT) as a graduation requirement may give insight into readiness for the NPTE. Widener University transitioned from a faculty generated comprehensive examination (FGCE) to the PEAT using Lewin's Planned Change Model. The purposes of this study were to (1) describe one program's transition away from a FGCE to the PEAT, (2) present findings of a data driven process to assess competency at graduation and prepare students for NPTE, and (3) explore student perspectives regarding this transition. **Methods.** Students from the Classes of 2019 (n=40) and 2020 (n=44) participated. The Class of 2019 completed the FGCE and the PEAT. The Class of 2020 was transitioned to the PEAT for graduation. Differences and associations were examined quantitatively, and student perspectives explored qualitatively. **Results.** The entire Class of 2019 passed the FGCE while only 51.0% (n=20) passed the PEAT; the correlations between the NPTE and the FGCE ( $r=.629$ ,  $p<.001$ ) were significant. **Conclusion.** By making the PEAT a high-stakes exam for the Class of 2020, first time pass rate drastically increased. These outcomes suggest the PEAT can be used as a graduation requirement; the transition should consider factors related to managing student perspectives and expectations.

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**Preparing Students for the National Physical Therapist Examination (NPTE): One Program's Experience with Using the Practice Exam and Assessment Tool (PEAT) as a Graduation Requirement**

## **ABSTRACT**

**Purpose.** Factors related to National Physical Therapist Examination (NPTE) performance have been widely reported in the literature, yet no strong predictors emerge offering faculty guidance on how to determine student readiness for the NPTE. The Practice Exam and Assessment Tool (PEAT) as a graduation requirement may give insight into readiness for the NPTE. XXX University transitioned from a faculty generated comprehensive examination (FGCE) to the PEAT using Lewin's Planned Change Model. The purposes of this study were to (1) describe one program's transition away from a FGCE to the PEAT, (2) present findings of a data driven process to assess competency at graduation and prepare students for NPTE, and (3) explore student perspectives regarding this transition.

**Methods.** Students from the Classes of 2019 (n=40) and 2020 (n=44) participated. The Class of 2019 completed the FGCE and the PEAT. The Class of 2020 was transitioned to the PEAT for graduation. Differences and associations were examined quantitatively, and student perspectives explored qualitatively. **Results.** The entire Class of 2019 passed the FGCE while only 51.0% (n=20) passed the PEAT; the correlations between the NPTE and the FGCE ( $r=.629$ ,  $p<.001$ ) and the PEAT ( $r=.679$ ,  $p<.001$ ) were moderate. In the Class of 2020, 88.6% (n=39) students passed the PEAT on the first attempt and the correlation with the NPTE was strong ( $r=.813$ ,  $p<.001$ ). The mean PEAT score for the Class of 2020 ( $666.3\pm 50.7$ ) was significantly higher ( $p<.001$ ) than the Class of 2019 ( $617.5\pm 52.7$ ). Student perceptions and emotive themes related to the transition corresponded to Lewin's Model. **Conclusion.** By making the PEAT a high-stakes exam for the Class of 2020, first time pass rate drastically increased. These outcomes suggest the PEAT can be used as a graduation requirement; the transition should consider factors related to managing student perspectives and expectations.

## INTRODUCTION

From the program's inception, XXX University's curriculum included a faculty-generated comprehensive examination (FGCE) as a graduation requirement. To better prepare students for the National Physical Therapist Examination (NPTE), faculty wanted to transition from the FGCE to the Practice Examination and Assessment Tool (PEAT) starting in 2020. In the 3 years prior to implementing the PEAT as the replacement for the FGCE, faculty discussed testing options for improving NPTE performance. Prior programmatic analysis of student NPTE performance indicated that the relationship between the FGCE and NPTE was at best moderate ( $r=0.616$ ,  $p<.001$ , Classes of 2016-2018), and the first-time NPTE pass rate had trended downward.<sup>1</sup> In addition, curricular revisions and programmatic changes due to the onboarding of 2 new faculty members would necessitate substantial edits to the FGCE. The PEAT was selected as a strategic replacement because it best replicates the testing expectations and conditions for the NPTE and its suggested correlation with pass rate.<sup>2,3,4</sup>

Doctor of Physical Therapy (DPT) programs want to ensure that graduates are competent practitioners and pass the licensure examination. Guided by the accreditation standards set forth by the Commission on Accreditation in Physical Therapy Education (CAPTE), licensure examinations confirm that entry-level practitioners possess the minimum knowledge and skills defined by the profession for competency and provide a regulatory mechanism that protects the safety of consumers. The determinant of successful preparation for licensure as a physical therapist is the NPTE, which must be completed with a scaled score of 600.<sup>5</sup>

Student licensure examination performance is one standard by which to judge how well academic institutions prepare graduates for entry-level practice. CAPTE requires physical therapy programs to publicly report NPTE pass rates.<sup>6,7</sup> One standard for continued program accreditation is an ultimate pass rate of 85% across a two-year period.<sup>6</sup> Maintenance of accreditation is an important consideration for DPT programs.

Given the value of continuing accreditation and the mission to ensure graduates have the capacity to practice in a safe and competent manner, DPT programs have an interest in preparing students to pass the NPTE on the first attempt and understanding factors associated with that outcome.

One method of assessing student competency and preparation is the implementation of a comprehensive examination in the final year of the curriculum following the completion of all didactic and clinical coursework. While programs can implement comprehensive examinations for multiple reasons, one goal is to provide students with an opportunity to prepare for the NPTE. DPT programs have utilized a FGCE for this purpose with the tacit understanding that student performance on a FGCE might correlate with and predict NPTE performance.

## REVIEW OF THE LITERATURE

### Factors Informing NPTE Performance

In the research, factors explored to predict student success on the NPTE include 1) individual pre-admission data, 2) academic professional program performance, 3) clinical performance, 4) executive function and comprehensive examination performance, and 5) programmatic descriptors and resources.<sup>8-21</sup> Pre-requisite science grade point average (GPA), program GPA, and degree status are factors predicting 40% of the variability in first-time NPTE performance.<sup>9</sup> Programs with 100% NPTE pass rates were more likely to be housed in public institutions, had higher average pre-requisite admission GPAs, greater overall expenditures per student, and a larger number of full-time core faculty per student.<sup>22</sup> Kume et al. found several variables with strong correlations to first time NPTE scores including verbal and quantitative GRE subscales, first year program GPA, and second/third year program GPA.<sup>10</sup> In general, the strengths of the prediction models have been variable and other indicators of readiness merit consideration.<sup>13</sup>

Exit examinations, that are comprehensive and a requirement for graduation, are reportedly related to scores on the NPTE.<sup>13,20,22,23</sup> These may offer insight, for both the program and the student, into the effectiveness of curriculum preparation and student readiness for licensure.<sup>13</sup> High-stakes examinations, when used as a graduation requirement and for making curricular decisions, need to be reliable and valid.<sup>24,25</sup> However, the technical requirements for their development - creating, validating, and administering - can be resource intensive for faculty.<sup>24</sup>

The PEAT, developed and administered by the Federation of State Boards of Physical Therapy (FSBPT), offers an alternative to FGCEs. The PEAT helps students prepare for the licensure examination using the same format and types of questions appearing on the NPTE. Additionally, the PEAT can meet the intent of exit examinations to determine student readiness for taking the NPTE. The PEAT consists of previously used and validated NPTE questions which are developed by experienced item writers. Upon completion of the PEAT, students receive detailed performance feedback by content area and body system.<sup>26</sup>

Some have suggested that scores on the PEAT correlate with passing the NPTE and may prepare students for future success on the licensure examination.<sup>3,4</sup> Students achieving a passing scaled score of 600 on the PEAT have a 99.3% passing rate on the NPTE.<sup>4</sup> Crawley et al. explored student preparation for the NPTE and hypothesized that students who used the PEAT for preparation were more likely to pass the NPTE on the first attempt.<sup>27</sup> For 93% of the sample that reported taking the PEAT (n=40) in preparation for the NPTE, there was no statistically significant correlation with first-time pass rate ( $r=0.10$ ,  $p=.533$ ). The study finding was inconsistent with data posted in a FSBPT report indicating a strong correlation between the PEAT and first-time passing rates on the NPTE. The discrepancy may be attributable to methodological differences in Crawley et al. as data collection relied on student self-reports. Additionally, this study did not correlate actual PEAT scores with first-time pass rate on NPTE and only looked at reported student use of the tool in preparation.<sup>27</sup>

### **Conceptual Framework Guiding the Transition Process.**

Making a substantial programmatic change requires careful framing to help students, along with faculty, understand the underlying rationale. Lewin's 3-stage theory of behavior change has been used to inform such transitions.<sup>28-31</sup> Wojciechowski et al., used this model to facilitate interprofessional collaboration in a large hospital setting, while Manchester et al., utilized this framework to instill evidence-based practices in a clinical setting.<sup>28,31</sup> This theory has also been used to guide and support health promotion as well as educational practice.<sup>29,30</sup>

Lewin's theory posits that organizational change needs deliberate planning to drive the shift from the status quo by overcoming any associated resistance.<sup>32</sup> The proposed 3-step change model involves the processes of Unfreezing, Moving and Refreezing (Figure 1).<sup>28,31,33</sup> Unfreezing entails highlighting the problem with the status quo and supporting individuals in relinquishing their perceived state of balance to accept change. Moving involves encouraging individuals to shift attitudes toward a new set of behaviors by emphasizing the advantages of change. The phase of Refreezing involves settling into a new equilibrium and demonstrating transformation by integrating and accepting the new policies and procedures.<sup>28,31-33</sup>

Lewin's model describes the process implemented by faculty to transition the students to accepting a new type of summative examination for which they had little experience. The model contextualized a process that had to occur for the students to reach a level of acceptance of the PEAT as the new norm for testing. Specific to this programmatic change from the FGCE to the PEAT, the goal was to achieve positive outcomes for both XXX students and faculty. Students would be better prepared for the NPTE, there would be a reduction in the effort required to create, score and administer the exit examination, and the program would acquire information that could help with curriculum planning. Given the dearth of research on high-stakes comprehensive examinations in the physical therapy curriculum, additional guidance or strategies are needed for faculty seeking ways to determine competency at graduation and readiness for the NPTE. There is a need to further investigate factors that foster student success on the NPTE. Student perceptions of methods implemented by programs to prepare them to take the NPTE may offer insight into how best to ready them. The purposes of this study were 1) to describe the transition from the FGCE to the PEAT, 2) present findings from the implementation of a data driven process to better assess competency at graduation and to effectively prepare DPT students for success on the NPTE and 3) explore student perspectives regarding this transition.

### **SUBJECTS**

Subjects included entry-level DPT students from the XXX Classes of 2019 (n=40) and 2020 (n=44). Inclusion criteria were: (1) full-time student enrolled in the DPT program; (2) completion of all necessary coursework for eligibility to take the FGCE or the PEAT; and (3) completed the FGCE and/or the PEAT. All students, who took the PEAT were included in the quantitative component of the study and were also given the opportunity to participate in the interview. Those students responding to the email solicitation for the interview were included in the qualitative component of the study. The study was reviewed and approved by the XXX University Institutional Review Board, and all participants provided signed informed consent.

### **METHODS**

#### **Procedures**

Students from the Classes of 2019 and 2020 were enrolled in a one-credit online course in the 3rd year of their final semester of study - PT 800 Comprehensive Examination. Learning experiences embedded in the course were the same for both cohorts. The course provided self-study resources and access to faculty using discussion boards. The exit examination was administered 2 weeks prior to graduation. PT 800 was pass/fail and based on successful completion of the respective required exit examination. Two attempts were allocated to meet the DPT program graduation examination requirement. A retest, if necessary, was given one week after the first test administration. Students unable to pass the exit examination after the second attempt received a failing grade in the course, which delayed their ability to graduate. Students unable to achieve the necessary passing score repeated PT 800 in subsequent semesters until a passing score was achieved. Each new enrollment provided one additional opportunity to take the examination.

Consistent with previous practice, students in the Class of 2019 had to pass the FGCE with a minimum score of 77%. All members of the Class of 2019 agreed to take the Academic version of the PEAT 1 week after completing the FGCE. The PEAT was given as a low-stakes, no penalty examination. Through this approach, the faculty hoped to determine if there was a relationship between performance on the FGCE, the PEAT, and the NPTE as well as use this information to support the class of 2020 in accepting the transition. By taking the PEAT, students in the 2019 cohort received the benefit of having a detailed performance report from FSBPT as well as a second practice examination for later use. The Class of 2020 was required to pass the PEAT as their exit examination, with a score of 600/800.

Qualitative interview questions were framed to explore students' perceptions as they related to the stages of Lewin's 3-step Planned Change Model. The procedure in how Lewin's model was utilized, including areas of qualitative questions overlaid on these phases, is described in Figure 2.<sup>32</sup> Question development was guided by themes that were brought up by students during meetings with the instructors for PT 800 (the authors) and to understand any barriers that students may have perceived to the change. Students also had the opportunity to add their views at the end of the interview to share additional ideas not captured by formed questions. Key informants from the Classes of 2019 (n=7) and 2020 (n=12) volunteered to share their perspectives on preparing for and taking the PEAT as a graduation requirement and its role in helping them prepare for the NPTE. One-on-one semi-structured interviews occurred after students completed the NPTE and received their final scores. Questions utilized are provided in Appendix 1. Interviews were conducted via Zoom by SC and KD, who had experience with qualitative methods, lasted an average of 20 minutes, were audio-recorded, de-identified and transcribed.

### **Instrumentation**

Descriptive measures for the cohorts included age, gender, degree at program entry, race/ethnic identity, and program GPA. The primary quantitative outcome measures were the first attempt scores on the FGCE, the PEAT, and the NPTE.

The FGCE was a paper-based examination consisting of three 50-question sections that attempted to mirror the content outline of the NPTE. It was developed by program faculty and revised after each administration to ensure consistency with the curriculum and with the NPTE content outline. Items included on the test were developed by faculty who had responsibility for teaching the content. Validation of the examination focused on item performance for difficulty and discrimination. Item difficulty was based on the percentage of students getting the question correct and the point biserial index was used to examine the correlation between item score and total examination score. Items performing poorly and deemed to be ineffective discriminators were eliminated from the scoring and the grade was recalculated based on the revised number of items in each section of the examination. Items that performed poorly were reviewed, revised and/or replaced prior to the next administration of the FGCE.

PEAT and NPTE data were provided by the FSBPT, which is responsible for item development, test construction, and item validation and provided the mechanism for electronic test administration. There are two versions of the PEAT – the Academic version and the Individual version. The Academic version is available to institutions while the Individual version can be purchased by students. The students completed the Academic version, which was purchased by the Program. The test is identical to the NPTE consisting of a 250-question examination, organized into five 50-question sections. The questions in the Academic PEAT are developed by experienced NPTE item writers and in the same format as the NPTE.<sup>9</sup> The PEAT was completed under similar testing conditions as the NPTE, proctored by the faculty.

### **Data Analysis**

Participant demographics were examined descriptively using counts, percentages, means and standard deviations appropriate to the level of measurement. Quantitative data from the FGCE, the PEAT and the NPTE were examined descriptively using means and standard deviations. For the PEAT and the NPTE, between group differences were analyzed using t-tests and associations between the two measures were explored separately for each of the classes using Pearson Correlation Coefficients.<sup>34</sup> Alpha was set at  $p < 0.05$ .

For the qualitative data, the research team independently reviewed the de-identified transcripts to identify themes that reflected student sentiments and perceptions about the transition and effectiveness in preparation for the NPTE.<sup>35</sup> After initial review, the research team met to corroborate themes. As the themes were of an emotive characteristic, they were coded based on their emotive nature by SC and KD independently and thereafter consolidated.<sup>36,37</sup> Thematic disagreements were resolved through consensus and discussions.

## **RESULTS**

Participant demographics are summarized in Table 1. The cohorts were similar in age and ethnicity and for the Class of 2020, a greater percentage entered the program already having a baccalaureate degree. Professional program GPA was the only statistically significant between group difference ( $p=.041$ ).

**Table 1. Participant Demographics**

Demographic	Class of 2019 (n=40)	Class of 2020 (n=44)
Age, y	25.1 ± 2.8	24.7 ± 1.6
Gender, m/f %	40.0/60.0	31.8/68.2
Program GPA	3.6 ± 0.2	3.7 ± 0.2*
Program Entry Method, %		
Post-baccalaureate	35.0	54.5
3+3 XXX Undergrad	42.5	38.6
4+3 XXX Undergrad	22.5	6.8
Ethnicity – Caucasian %	72.5	75.0

GPA – grade point average

Program Entry Method: 3+3 - 3 years undergraduate and 3 years professional; 4+3 - 4 years undergraduate and 3 years professional

\*  $p<.05$

Table 2 reveals the differences between the cohorts based on the PEAT and NPTE scores. The Class of 2020, which was required to complete the PEAT, scored significantly higher than the Class of 2019 ( $p<0.001$ ). While the Class of 2020 on average scored higher on the NPTE, the difference was not statistically significant ( $p=0.337$ ). When examining the first-time passing score on the PEAT, 50.0% of the Class of 2019 were successful compared to 88.6% of the Class of 2020 (Table 3). The Class of 2019 had a 100.0% passing rate on the FGCE that was completed 1 week prior.

**Table 2. Mean (SD) Scores on the PEAT and NPTE for the XXX University Classes of 2019 and 2020 and All Test-takers in the Nation.**

Graduation Year	PEAT	NPTE	National NPTE
Class of 2019	617.5 ± 52.7	683.9 ± 51.6	672.7 ± 74.5
Class of 2020	666.3 ± 50.7*	694.8 ± 47.7	680.4 ± 73.5

\* $p<.05$

The relationship between scores on the FGCE, the PEAT, and the NPTE presented in Table 3 were statistically significant ( $p<0.001$ ) and moderate (0.50-0.75) to strong ( $>0.75$ ).<sup>34</sup> The relationship between the FGCE and the NPTE ( $r=0.536$ ) was weaker than the PEAT and the NPTE (Class of 2019,  $r=0.679$ ; Class of 2020,  $r=0.813$ ). The Class of 2019 and 2020 had 97.4% and 97.7% first-time passing rates on the NPTE, respectively. The average NPTE score for the Classes of 2019 and 2020, when compared to national averages,<sup>38</sup> were higher (Table 2).



**Table 3. First Attempt Pass Rate and Score on the PEAT and NPTE for the Classes of 2019 and 2020 and Correlations between the PEAT and NPTE**

	Class of 2019 n=40	Class of 2020 n=44
PEAT Passing Score 600/800 – First Attempt	50.0%	88.6%
PEAT Score Correlation with NPTE Score	r=0.679*	r=0.813*
FGCE Correlation with the PEAT	r=0.607*	--
FGCE Correlation with NPTE	r=0.536*	--
	n=39†	n=43†
NPTE Pass Rate on 1st Attempt – XXX University	97.4%	97.7%
NPTE Pass Rate on 1st Attempt – National Average	91.0%	91.0%

FGCE – Faculty-Generated Comprehensive Examination \*p<.001

†One person in each class did not release NPTE scores

All key informants (n=12) from the Class of 2020 successfully passed the PEAT and the NPTE on the first attempt. Two key informants from the Class of 2019 did not pass the PEAT on the first attempt and all (n=7) achieved a passing NPTE score on the first attempt. Table 4 presents emotive themes with illustrative quotes for the Class of 2020. These are placed within Lewin's stages of change and inform how the process was perceived by the students.

**Table 4. Selected examples of cohort of 2020 student's perceptions and emotions related to the transition from the FGCE to the PEAT with illustrative quotes and corresponding stage of Lewin's Model**

Lewin's Stage: Unfreezing	
Emotion	Illustrative Quote
Stress & Anxiety	S20-4: It was stressful, just because it was thought to be a comprehensive exam - which is a whole different way of studying compared to studying for the PEAT - which is questions that we've never been exposed to really. But so stressful  S20-10: So, I think it was explained well to us. I think it was just like the overall fear of being that first class of going through it.
Frustration with Concurrent Understanding	S20-11: I think - like most of my class - we were a little frustrated with the transition so late into the program. But with an understanding that you guys were doing - the professors were doing - what they thought was best for us. And would make us the most successful in our boards, which is obviously one of the most important tests that we take. I think it was a tough decision that you guys made and it put a little bit extra stress on us as students. Studying for a completely different worded test as we had been preparing for the comp exam throughout our whole experience. Ready to take tests with wording of questions that we were not used to. And then to switch to the NPTE which we had not had any experience with, I think, was scary. But again, with understanding that it was in our best interest.
Worry & Apprehension	S20-5: I definitely had concerns with the passing portion of it just because studying during clinicals is a lot

	S20-10: I was really apprehensive about how am I going to study when I'm going to be at this clinical for 10-12 hours, almost every day and be able to study, to the caliber where I'm going to pass a retired license exam.
<b>Lewin's Stage: Moving</b>	
Emotion	Illustrative Quote
Support	S20-12: They held the pre-zoom like check in so we knew what a room setup could be. That took a lot of day of testing anxiety away from me. So that was really nice.
Acceptance	S20-6: I absolutely understood it would better preparation for the actual NPTE, which I completely agreed with.  S20-10: I didn't necessarily think it was a bad idea because obviously it's prepping us for that license exam at the end. it was explained well to us and I think it was for our best interests.
<b>Lewin's Stage: Re-freezing</b>	
Fatigue & Burnout	S20-2: I personally burned out after the PEAT, I studied and peaked for the PEAT and then after that, I was like, I'm going to take a week off and then I never was able to get back into it.  S20-10: Just because I was studying that same NPTE material for five months I was very burnt out, and it was really a struggle to kind of to wrap everything up those last few weeks before the actual license exam
Financial burden	S20-1: I had a very hard time wanting to study for the NPTE and I used a lot of my study materials for the PEAT and I had to pay for additional. I just feel like we spent a lot more money than you normally would have if you're just taking the regular one PEAT because it's like you're taking it twice because of the score requirements  S20-7: I did end up having to buy a second study book instead of practice exams and I think I took more practice exams and just stretched my studying over a much longer period - which was a little bit difficult...
Confidence	S20-11: It just kind of more prepared me for the types of questions that we would be asked in the following week on the Academic PEAT. So, I was able to see the system, how it works, that I wasn't confused by the setup of it or anything like that. And then I was able to see how FSBPT words questions and what their focus is more on.  S20-4: I do think that the PEAT did prepare me very - I wasn't as anxious going into the NPTE as I was going into our PEAT - to pass. Which was really nice. And I felt like I had taken so many practice PEATs at that point. I was, statistically, I should not not pass in NPTE. So that was in my head. I'm running the numbers while I'm doing it. But, so that was a nice feeling as well. So, it was an extra boost of confidence, I would say.

Students expressed concern regarding the timing of when they were notified of the change to the PEAT, that the pass rate was the same as that of the NPTE which was perceived as too high prior to graduation, and that they had to study for this 'new' examination during their final clinical education experiences. The Class of 2019's experience with the PEAT impacted the 2020 cohort's perception of this examination. Half of the Class of 2020 participants (6 of 12) indicated a negative impact on their perception. As one student reported:

"[The Class of 2019] showed us their scores, which was a little concerning at the moment because I know a lot of people didn't quite get over 600 when they took the PEAT. So, I think that kind of added to a lot of our stress because we saw that and we were like, and you're telling us we have to get a 600 and all these people didn't, but I know that they don't have a score requirement. So obviously, a lot of people don't take it seriously." S20-1

On the other hand, a quarter of the students (3 of 12) of the Class of 2020 expressed a positive perception around their own success and the potential benefits after speaking with the Class of 2019.

"And they shared with me that the PEAT was a really good tool, but they did it after the comp exam. They weren't as fully prepared for it as they could have been. Because it was - I was told - it was a voluntary experience and they just kind of went into it like not really being super prepared for it. But they shared that it was probably going to be in our benefit, because it would be really helpful for the NPTE." S20-3

Students from both cohorts reported changing their study strategy for the PEAT as compared to the FGCE. Students from the class of 2019 and 2020 respectively reported

"With the [FGCE], going back a little bit more into previous notes and previous class work. Looking back through different notes I'd taken for specific classes that I thought I was going to need for the PEAT. Also took some of the online material that kind of prepped you like practice questions, the practice tests that they had online through one of the board websites. It was more in a way of you know, getting the questions the way that the PEAT, and the board would ask, instead of just trying to cram knowledge from old classes." S19-10

"It's a completely different way of studying and focusing on what to highlight in your study material because we know how certain professors asked questions and stuff like that versus the PEAT is very specific statistically like thought through and analyzed." S20-8

Students from the Class of 2019 (6 of 7) expressed their disinvestment in the PEAT after the FGCE as a reason for poor performance on the PEAT.

"Because we did not care. I'm going to be dead honest." S19-1

"I think was the first time that everyone could not worry about ruining their lives with the test for a little bit. I would feel very confident speculating that people did not study for that PEAT." S19-6

All students from the 2019 cohort expressed that the PEAT best prepared them for the NPTE.

"The PEAT- because it's definitely the most realistic. Just the setup of it, the way the questions were read. When I took the NPTE I felt like I was taking a practice PEAT. It also made me much more comfortable. When I sat for the NPTE itself it felt so much like the practice test; it wasn't this like foreign thing. That helps decrease my anxieties inside already taking something that was so similar." S19-2

"I think that the PEATs are above everything, the best thing that you can do. I think the [review] course was good. I think that for someone like me who never really seemed to struggle with taking tests until I got into the PT program - I felt like a lot of the tests throughout my PT career there, I just wasn't understanding what they were trying to get at. And the NPTE and the PEAT questions intrinsically made more sense to me." S19-6

## DISCUSSION AND CONCLUSIONS

The study findings indicate the transition to the PEAT as a comprehensive examination and graduation requirement was successful and achieved the desired departmental outcome related to better preparing students to pass the NPTE. Mean scores on the NPTE for the class of 2020, while not significantly different from the prior cohort, still went up and exceeded the national average for the NPTE. The first-time pass rate and mean score on the PEAT drastically increased when comparing the Classes of 2019 and 2020. For the Class of 2019, the correlations between scores on the PEAT and the NPTE ( $r=0.679$ ) were higher than the FGCE and the NPTE ( $r=0.536$ ). The strongest correlation between the PEAT and NPTE ( $r=0.813$ ) occurred for the Class of 2020, when it was implemented as a high-stakes examination and students perceived the importance of the need to obtain a passing score to graduate. Other authors examining the relationships between FGCE or the PEAT and the NPTE have found weaker relationships ( $r=.380 - .709$ ) than were identified in the current study.<sup>13,18,20,23,39</sup> When given as a high-stakes examination, test preparation methods changed, which was a theme emerging from the qualitative interview data and can account for the differences in the strength of the association between the PEAT and NPTE and performance differences on the NPTE. While not significantly different, the Class of 2020 scored higher on the NPTE potentially indicating better preparation. However, the lack of statistically significant differences in the NPTE scores may be explained by the opportunity for additional practice afforded to the Class of 2019. This cohort took both the FGCE and the PEAT while the FGCE was not available to the Class of 2020. There were no significant curricular content changes to explain testing differences. While Program GPA was significantly greater for the Class of 2020, uncertainty exists as to its role in PEAT and NPTE performance given the uncertainty surrounding the relationship reported in the literature.<sup>9,10,13</sup>

Surprisingly, only half of the Class of 2019, who one week prior was 100% successful in passing the FGCE, were able to pass the PEAT on the first attempt. The fact that students from this class could be successful on the FGCE yet "fail" the PEAT one week later was concerning. This may be because faculty created questions may not correlate relative to style, content or question difficulty when compared to PEAT questions. Additionally, the FGCE and the PEAT may test knowledge and clinical decision making in a different manner.

The qualitative findings indicate that most in the Class of 2019 did not put as much effort into the PEAT because it was not a high-stakes examination. The reflections explain their poor PEAT performance but did not provide faculty with data to support the transition for the class of 2020 to utilize in the Unfreezing phase.

As part of moving into the Refreezing phase, students interviewed reported being apprehensive about taking the PEAT as a graduation requirement but communicated having less anxiety in the weeks prior to and during the NPTE. The level of preparation associated with taking the PEAT and having a second PEAT examination for later use, including formative feedback from both tests, effectively prepared them for the NPTE based on interview and performance data. Students reported preparing differently for the PEAT versus the FGCE, where the latter primarily focused on review of program specific student notes. In addition, the FGCE was perceived as being less challenging than the PEAT and the NPTE. The perceived benefits of using the PEAT were its study mode which provides feedback on why a response is correct or incorrect. This allowed students to learn from their mistakes, understand how NPTE questions were structured, and have the resources for further preparation. This formative feedback was not available following the FGCE. Additionally, the PEAT provided testing conditions very similar to the NPTE including duration of the exam requiring students to develop test endurance. The FGCE did not provide this preparation.

Many of the students interviewed supported using the PEAT as an indicator of readiness to take the NPTE prior to graduation. Despite reported feelings of anxiety with taking the PEAT 2 weeks prior to graduation, many were advocates of moving the PEAT earlier in the program as a benchmark to take the NPTE before curriculum completion. FSBPT policy allows candidates to take the NPTE up to 90 days prior to graduation, which 70% of the jurisdictions allow.<sup>40</sup> A future discussion point for XXX faculty may be the use of the PEAT to allow interested students to take the NPTE prior to graduation. While this is an option within the physical therapy profession, taking a licensure exam prior to graduation may not be allowed for all disciplines.

When examining the published literature, the quantitative findings align with the report generated by FSBPT staff and support the relationship between type of preparation and NPTE performance.<sup>4</sup> For students passing the PEAT with a scale score of 600 in the Class of 2020, the vast majority went on to successfully pass the NPTE on the first attempt with scores exceeding the national average. Students passing the PEAT on the first attempt with a scale  $\geq 600$  are 14 times more likely to pass the NPTE on the first try.<sup>18</sup> For the Class of 2019 where the PEAT was optional, only 1 person was not able to pass the NPTE on the first attempt despite the large number of students scoring less than 600. Thus, some caution is necessary as exit examination performance as a condition for graduation is not always predictive of success on licensure examinations.<sup>25,41,42</sup> When using the PEAT as a formative assessment, Baldwin reported it could correctly classify students 88.0% of the time with better sensitivity (98.9%) than specificity (17.9%) when predicting success on the NPTE.<sup>42</sup>

These findings stand in contrast to the work by Crawley et al. who surveyed program graduates about NPTE preparation strategies and found no relationship with using the PEAT ( $r=0.10$ ,  $p=.533$ ).<sup>27</sup> The difference likely reflects the high-stakes nature of the approach used by the XXX versus just surveying students as to which methods they choose in preparation for the NPTE after graduation. Other types of practice examinations completed by study participants also did not correlate significantly with NPTE performance.<sup>27</sup> However, a systematic review and meta-analysis identified the value in having students complete a comprehensive examination to validate their readiness for the NPTE on the relationships found.<sup>13</sup>

The outcomes of the quantitative and qualitative aspects of this study suggest that the PEAT can be used as a graduation requirement. The transition, however, should consider factors related to managing student expectations and emphasizing the benefits of a different testing approach. It is evident that preparing students for high-stakes examinations, such as the PEAT if used for a graduation requirement, requires faculty planning. Planning may also include student considerations for clinical education, specifically commute times, as longer drive times may factor into decreased study time. Additionally, the faculty supported students by including online review sessions, ongoing guidance and sharing helpful resources. The transition to the PEAT resulted in a significant benefit for faculty. There was the elimination of faculty effort required to create, validate, administer, analyze, and update a FGCE each year. FSBPT delivers the PEAT in a secure, electronic format, which reduces the burden of administering the examination. Since the PEAT is validated, standardized, and automatically scored, the efforts devoted to item analysis for a FGCE were eliminated. As new versions of the PEAT are periodically available, older versions will be removed and the newer version will automatically be the one used, thus keeping the PEAT current.

The findings from the study serve as a guide for DPT programs seeking options other than a FGCE to determine readiness for graduation. The PEAT provides faculty with the option to use an examination that is validated by content experts as representing current entry-level practice. Faculty interested in implementing a similar transition should create a plan that helps students prepare for change such as the model proposed by Lewin.<sup>28,31-33</sup> These qualitative findings provide insight into why there may be

resistance to change that can help with the planning process. Programs should use evidence to support curricular changes and this case study provides findings from a data driven process implemented over the course of 3 years.

### **Study Limitations**

One study limitation involves the ability to generalize the study findings, which are based on the performance of 2 student cohorts from a single program. The amount of student-selected practice or use of other learning resources in preparation for the PEAT and NPTE was not controlled and could be a factor in the findings. Negative feedback provided to the Class of 2019 on their PEAT performance may have facilitated a change in how that cohort prepared for NPTE.

While this program decided to use PEAT as high-stakes exam as a graduation requirement, comprehensive exams may be utilized formatively. Such decisions may be influenced by program philosophies and discipline specific accreditation requirements. The authors appreciate that some of the findings may not be transferable to other health profession programs.

### **Conclusions**

Programmatic outcomes and accreditation are tied to student success on the NPTE. The outcomes suggest that the PEAT can be implemented as a graduation requirement and/or to prepare students for successful completion of the NPTE. For programs considering changing from a FGCE to the PEAT, strategies that emerge from this study reinforce planning and supporting students through this change and making it a high-stakes examination to maximize student engagement.

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Figure 1 – Conceptualization of Lewin's 3-Step Planned Change Model

Figure 2 - Lewin's Planned Change Model with Utilization and Qualitative Question Overlay