PhysPort Implementation Guide: Physics Teacher Education Progress Assessment (PTEPA Rubric) Version 2.0



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Implementation

Purpose of the PTEPA Rubric

To characterize physics teacher education programs in order to provide guidance for self-improvement and enable comparisons among programs.

Course Level: What kinds of courses is it appropriate for?

Upper-level, Intermediate, and Intro college

Content: What does it assess?

Teaching (Institutional commitment, leadership and collaboration, recruitment, knowledge and skills for teaching physics, mentoring community and professional support, program assessment)

Timing: How long should I give students to take it?

60-120 minutes

Example Questions

Example of PTEPA Rubric items for Objective 2D: Sustainability of structures:

Objective 2D: Sustainability of structures

Continuation does not depend on the actions of specific individuals but on organizational

structures and processes.

Benchmark Level of The Item	Rating	Explanation
Institutionalization of coursework (2D-1). Key courses that support PTE (such as a physics pedagogy course) are regular offerings, appearing in the course catalog (i.e., "on the books").		
Institutionalization of certification structures (2D-2). Key structures that support certification ease have been institutionalized, such as teaching tracks, certification pathways, agreements on how credits will contribute to the major, creation of a bachelor of arts option or teaching concentration in physics, etc.		
Routinized practices (2D-3). Key practices that support PTE (such as course assignments, Learning Assistant programs, or requests for learning assistants or graduate assistants) have been routinely practiced for at least three years, embedding them into institutional memory.		
Funding stability (2D-4). Operational funding of core activities is mostly guaranteed for at least the next three years.		
Other (please describe):		
Tabulate the number of \checkmark s above (including \checkmark and \checkmark +). This is your number of Benchmark Level items.		
Is this number of Benchmark Level items at least half the total number of items in the objective? If so, this objective as a whole meets Benchmark Level: Indicate this with a \checkmark .		

Example of PTEPA Rubric items for Objective 4D: Mentoring and community for future physics teachers:

Objective 4D: Mentoring and community for future physics teachers

Future physics teachers receive mentoring to support progress toward certification and retention in the profession.

Benchmark Level of The Item	Rating	Explanation
PTE mentor (4D-1). Future physics teachers are paired with at least one mentor who coaches them in their teaching career, coursework, and teaching skill development.		
K12 teacher interaction (4D-2). Future physics teachers interact at least a few times each year with a current or former K-12 teacher with a strong physics background (e.g., Teacher in Residence, Master Teacher, in-service teachers visiting campus, etc.).		
Future teacher community (4D-3). Future physics teachers have a supportive community of STEM teacher candidates through community-building events, a lounge, and/or shared workspace dedicated to future teachers.		
Alumni community (4D-4). Physics teacher alum can engage in a local professional community through events hosted by the university or local/regional physics teacher groups.		
Other (please describe):		
Tabulate the number of \checkmark s above (including \checkmark and \checkmark +). This is your number of Benchmark Level items.		
Is this number of Benchmark Level items at least half the total number of items in the objective? If so, this objective as a whole meets Benchmark Level: Indicate this with a \checkmark .		

Access: Where do I get the assessment?

Downloadable PDF and interactive Excel versions of the PTEPA Rubric are available at: https://phystec.org/ptepa-rubric

Versions and Variations: Which version of the assessment should I use?

The most recent version of the PTEPA Rubric, released in 2024, is version 3.0. Version 2.0 was released in 2018. From 2018 - 2022, the PTEPA was used extensively by the PhysTEC community, and the evaluators analyzed the results for validity, reliability, and association with physics teacher graduation rates. Based on those results, this current rubric version is streamlined for the most essential elements and usability.

Updates in Version 3.0:

• Moved the name and focus from PTE "programs." We changed the name from Physics Teacher Education Program Analysis Rubric to the Physics Teacher Education Progress Assessment, reflecting a shift away from thinking about PTE as necessarily occurring within a well-defined PTE program.

- Used the Chasteen-Lau structure. We organized the top-level categories to align with the Chasteen-Lau framework, which was validated as a model of sustainable physics teacher education at institutions.
- Used "goals" and "objectives." We used the more familiar terminology of "goals" and "objectives" to describe the aims of physics teacher education efforts (instead of the original accreditation-oriented language of "standards" and "components"). We used four objectives per goal for consistency of scoring and validity.
- Reduced to one level. We now show only the desired (Benchmark Level instead of four Levels (Not Present, Developing, Benchmark, Exemplary). This presentation is more straightforward and more effective for action planning. Users then rate only on whether they achieved the desired Benchmark Level or are slightly above or below it rather than selecting among four distinct ratings.
- Provided targets. We identified an explicit target of "achieving 50% of the elements at least Benchmark Level or above in each objective and goal" based on regression studies showing this is predictive of long-term success.
- Modified items. We removed or re-worded items that were commonly misinterpreted, difficult to rate, or not well-defined. We
 added items based on evaluation or research. We removed the designated "Prevalent" notation on some items, which were
 more common but not shown to have any special relationship to graduation rates. We aimed for four to five items per
 objective for simplicity and validity. We defined key terms in the text and removed most footnotes.

Administering: How do I give the assessment?

The PTEPA Rubric is intended to be used primarily as a self-study instrument of physics teacher education programs. It is best completed by a program team, in consultation with key stakeholders, to get the most accurate program ratings and best interpretation of results.

Scoring: How do I calculate my students' scores?

Tabulate your results within each objective, goal, and the full PTEPA using the PTEPA Tabulation Sheet. Based on research showing that more sustained programs achieve broad strength in the rubric, we recommend programs achieve 50% Benchmark Level or higher in each goal. The goals are in roughly chronological order for PTE efforts because it takes time to achieve such overall strength.

Clusters: Does this assessment include clusters of questions by topic?

There are 4 goals on the PTEPA Rubric with 4 objectives in each. These goals are: 1) People with Knowledge, Skills, and Motivation to Support Physics Teacher Education, 2) Structures and Resources That Support Physics Teacher Education, 3) Cultures and Context That Support Physics Teacher Education, and 4) Educating Many Qualified Physics Teachers.

Typical Results: What scores are usually achieved?

There are no typical scores on the PTEPA, as it is meant to be used for self-study to show you the strengths and weaknesses of your program. To see examples of results on Version 2.0 for high-producing physics teacher education programs, see the full report, <u>A Study of Thriving Physics Teacher Education Programs</u>.

Interpretation: How do I interpret my students' scores in light of typical results?

You should not expect your program to be successful in all areas of the PTEPA. The "Thriving Programs" studied for developing the PTEPA Rubric had up to 21% of items rated below Benchmark Level on that original version of the rubric. Not all items are essential for every institution. Best practices are context-dependent, and you should adapt your activities and structures to your individual goals, environment, resources, and constraints.

- Identify items, objectives, and goals that represent local strengths. How can you leverage and communicate these strengths?
- Identify items where your program does not meet Benchmark Level; is this an area you think is essential to improve in?
- Identify objectives and goals for which your PTE is not meeting at least 50% of the items at Benchmark Level. Are these areas that you think are essential to improve in?

Resources

Where can I learn more about this assessment?

R. Scherr and S. Chasteen, <u>Initial findings of the Physics Teacher Education Program Analysis rubric: What do thriving programs</u> <u>do?</u>, Phys. Rev. Phys. Educ. Res. **16** (1), 010116 (2020).

The <u>developer's website</u> contains much more information about the Thriving Programs Study and the Physics Teacher Education Program Analysis Rubric.

The PTEPA Rubric Developer's Website includes:

- User's Guide
- PDF and Excel versions of the PTEPA Rubric
- Full Report: A Study of Thriving Physics Teacher Education Programs

Translations: Where can I find translations of this assessment in other languages?

Background

Similar Assessments

There are no rubrics similar to the PTEPA Rubric.

Research: What research has been done to create and validate the assessment?

Research Validation: Gold Star 📩

This is the highest level of research validation, corresponding to all seven of the validation categories below.

- Sased on research into relevant theory and/or data
- Studied using iterative use of rubric
- Studied using inter-rater reliability
- Studied using expert review
- Research conducted at multiple institutions
- Research conducted by multiple research groups
- Peer-reviewed publication

Research Overview

Through extensive engagement with theory, analysis of existing instruments, review of relevant studies, and direct observations of thriving programs, independent researchers and PhysTEC staff collaborated on the development of the PTEPA Rubric. The researchers conducted in-depth visits to eight thriving physics teacher education programs. Program visits were conducted either in-person or virtually, and each visit involved interviews with a wide variety of stakeholders, including program leaders, administrators, teachers, staff, and students. Analysis of the data from thriving programs contributed strongly to the development of the rubric, provided initial validation, and supported research findings. Review by nationally recognized experts in physics teacher education as well as extensive alignment with literature and accreditation processes established substantive validity, content validity, and face validity. During the development and validation process, the PTEPA Rubric was iteratively improved through over 20 versions to better reflect the practices and structures of diverse thriving physics teacher education programs.

Developer: Who developed this assessment?

Stephanie V. Chasteen, Rachel E. Scherr, Monica Plisch, and the PhysTEC Project

References

- S. Chasteen and R. Scherr, <u>Developing the Physics Teacher Education Program Analysis rubric: Measuring features of</u> <u>thriving programs</u>, Phys. Rev. Phys. Educ. Res. **16** (1), 010115 (2020).
- R. Scherr and S. Chasteen, <u>Development and validation of the Physics Teacher Education Program Analysis (PTEPA)</u> <u>Rubric</u>, presented at the Physics Education Research Conference 2018, Washington, DC, 2018.

• R. Scherr and S. Chasteen, <u>Initial findings of the Physics Teacher Education Program Analysis rubric: What do thriving</u> programs do?, Phys. Rev. Phys. Educ. Res. **16** (1), 010116 (2020).