

Measuring university practices & leadership

Rigorous development of a rubric to assess physics teacher education programs

See phystec.org/thriving

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We acknowledge funding from NSF-0808790 and APS's 21st Century Campaign for development of the PTEPA Rubric. This work was conducted by Chasteen Educational Consulting and Scherr & Associates.

The take-home message

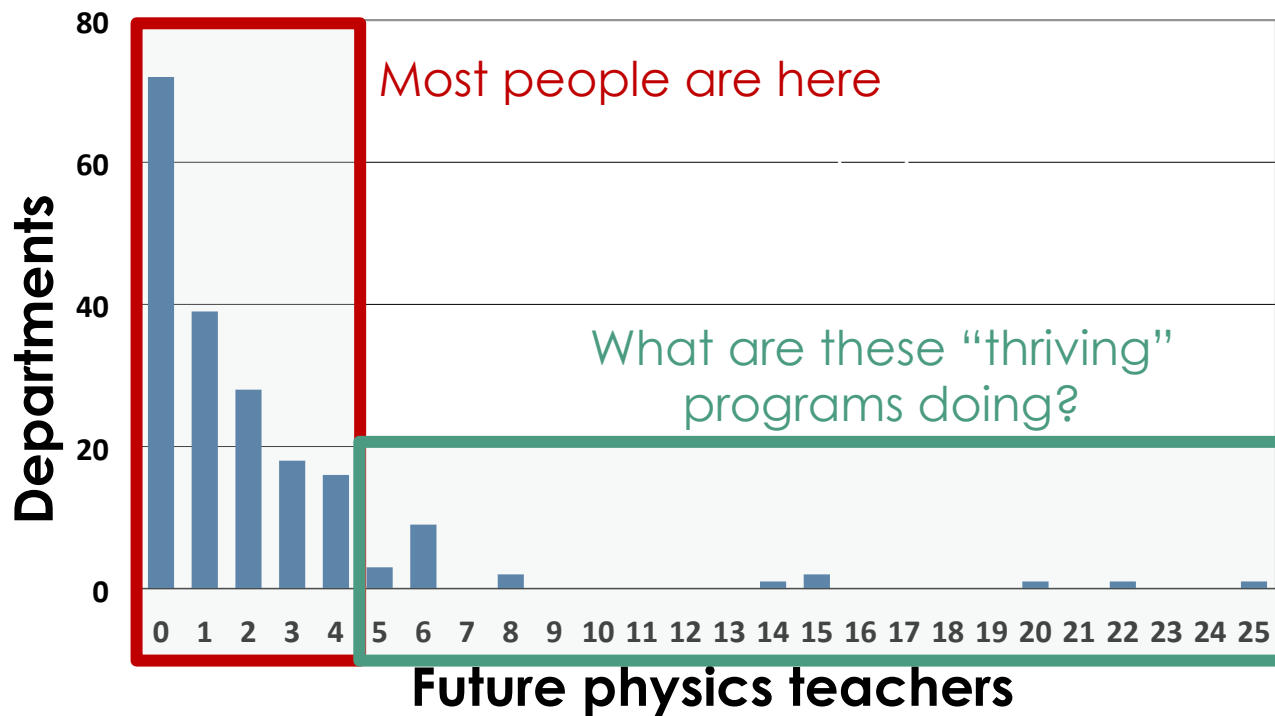
We developed a **rubric** to evaluate what different physics programs do to prepare future physics teachers.

Development was extensive and addressed needs of the client and community and systemic change.

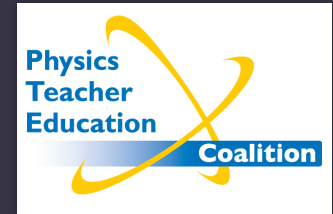
The rubric offers a **roadmap to best practices**, and allows measurement of program growth and continuous improvement.



Few physics departments educate many future teachers



Client (PhysTEC)



“Let’s develop a rubric to see what thriving programs are doing.”



Rubric development: Iterative and collaborative

1. Pilot rubric
2. 2-day site visit with “thriving program”
3. Rated on draft rubric
4. Drafted new version of rubric (wording, items)
5. Used new version at next site visit (8 sites total)

	NP	Possible attributes at Developing Level	Possible attributes at Benchmark Level	Possible attributes at Exemplary Level
2A: Program Team Members				
<i>The program consists of a team^{1,2} whose members are in positions that enable effective leadership.</i>				
2A-1 PTE program leaders¹ PREVALENT	<input type="checkbox"/>	<input type="checkbox"/> Program leaders include at least one faculty member.	<input type="checkbox"/> Program leaders include two faculty members.	<input type="checkbox"/> Program leaders include three or more faculty members.
2A-2 PTE program team² PREVALENT	<input type="checkbox"/>	<input type="checkbox"/> Team consists of one person in addition to the leader(s).	<input type="checkbox"/> Team consists of two people in addition to the leader(s).	<input type="checkbox"/> Team consists of at least two people in addition to the leader(s), at least one of whom is a faculty member.
2A-3 Teacher in Residence (TIR)³ PREVALENT	<input type="checkbox"/>	<input type="checkbox"/> There is a part-time physics TIR, or there is a science TIR (at any FTE).	<input type="checkbox"/> There is one FTE physics TIR.	<input type="checkbox"/> There is more than one FTE physics TIR.
2A-4 Teacher Advisory Group (TAG)⁴	<input type="checkbox"/>	<input type="checkbox"/> There is a science TAG.	<input type="checkbox"/> There is a physics TAG (significant physics teacher membership).	<input type="checkbox"/> There is a physics TAG that is readily available for consultation by the PTE team.

20 rubric versions
 Close collaboration with client
 Careful thought about messaging & categories of items

PTEPA Rubric Standards and Components

- ~90 **items**
- Organized into 6 **standards**
- 3-4 **components** per standard

“System roadmap”



Standard	Components
1. Institutional commitment	<ul style="list-style-type: none"> • Climate and support • Reward structure • Resources

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“System roadmap”



Standard	Components
1. Institutional commitment	<ul style="list-style-type: none"> • Climate and support • Reward structure • Resources
2. Leadership and collaboration	<ul style="list-style-type: none"> • Team members • Team attributes • Collaboration with SoE.
3. Recruitment	<ul style="list-style-type: none"> • Opportunities • Activities • Early teaching experiences • Streamlined program
4. Knowledge and skills	<ul style="list-style-type: none"> • Physics content • Pedagogy • Practical K-12 experience
5. Mentoring and community	<ul style="list-style-type: none"> • Physics community • Physics education mentoring • In-service development
6. Program assessment	<ul style="list-style-type: none"> • Outcomes • Evaluation • Communication to stakeholders

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“System roadmap”



3 item levels

NP	Developing	Benchmark	Exemplary
		Recommended level	



3 item levels

Item: Positional Power of program team

NP	Developing	Benchmark	Exemplary
<input type="checkbox"/>	<input type="checkbox"/> At least one member of the team is tenure-track.		



3 item levels

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3 item levels

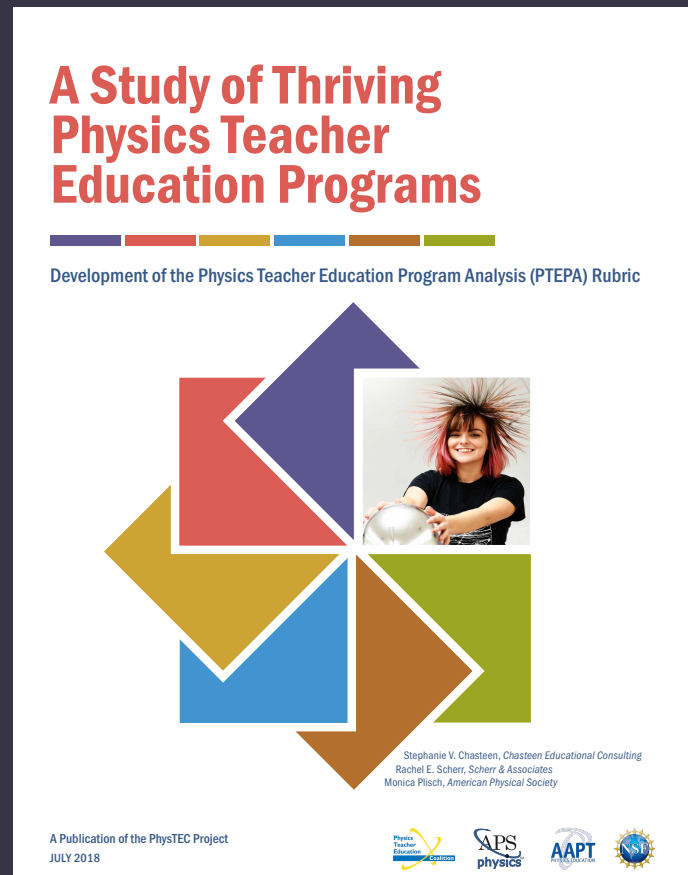
Item: Positional Power of program team

NP	Developing	Benchmark	Exemplary
<input type="checkbox"/>	<input type="checkbox"/> At least one member of the team is tenure-track.	<input type="checkbox"/> At least one member of the team is tenured.	<input type="checkbox"/> At least one member of the team holds positional power in the department.



Phystec.org/thriving

- Full report (with examples of practices)
- PTEPA Rubric
- User's Guide and support materials



Is the rubric measuring what we want in a useful way?

Validity: It measures what programs do, but not yet correlated with teacher production (see report)

Ethics: No numerical rubric scores (“Benchmark” is NOT a “2”); that could be harmful.

Framing: Rubric is not prescriptive (not one size fits all; a catalog, not accreditation).

Use: Many supports & visuals developed for users.



User feedback



- ❖ It helps **OUTLINE THE SPACE** of what is involved in physics teacher education
- ❖ It is useful to **LOOK FOR IDEAS**
- ❖ It is useful in **PLANNING FOR ACTION**
- ❖ It can be shared with a Dean to **MAKE A CASE FOR RESOURCES**



Users complete the
rubric (not
evaluators)

It's a PTEPA party!

who?

You and your physics teacher education (PTE) program team and other relevant stakeholders.

what?

Work together to complete and discuss the Physics Teacher Education Program Analysis Rubric*, choosing the most descriptive ratings for your program, discussing the meaning of the data, and deciding on next steps.

why?

We can best make sense of data and use it for improvement when we work together and talk it through.

when?

Anytime! You may wish to take advantage of natural times to focus on strategic planning and reflection, such as:

- Program planning
- Preparing annual reports
- Preparing to make a case for program resources
- Preparing a talk or presentation
- Department strategic planning
- Department or college retreats

how?

Below are some possible formats for your group (allow about three hours, including time to come to consensus and clean up your ratings)

Series. A series of shorter meetings (e.g., one standard per meeting).

Retreat. A single longer meeting.

Segmental. Focus on certain sections of the rubric with certain groups.

Individual. Complete the rubric individually and then meet to discuss as a group.

Coached. Invite a PhysTEC evaluator to act as a reflective coach.

so what?

- What is your evidence for your ratings?
- Where do you disagree?
- What other information do you need?
- What have you learned, and what surprises you?
- What response is required?

then what?

Look at your results as a whole and determine your plan for action! Share your data with stakeholders to generate program support.

* phystec.org/thriving



Supports for users

PDF and Excel rubrics
Built-in action planning
Required for funded sites
User's Guide, handouts, and more

Excel (interactive)

...ing effective collaboration between physics and education.

ership.

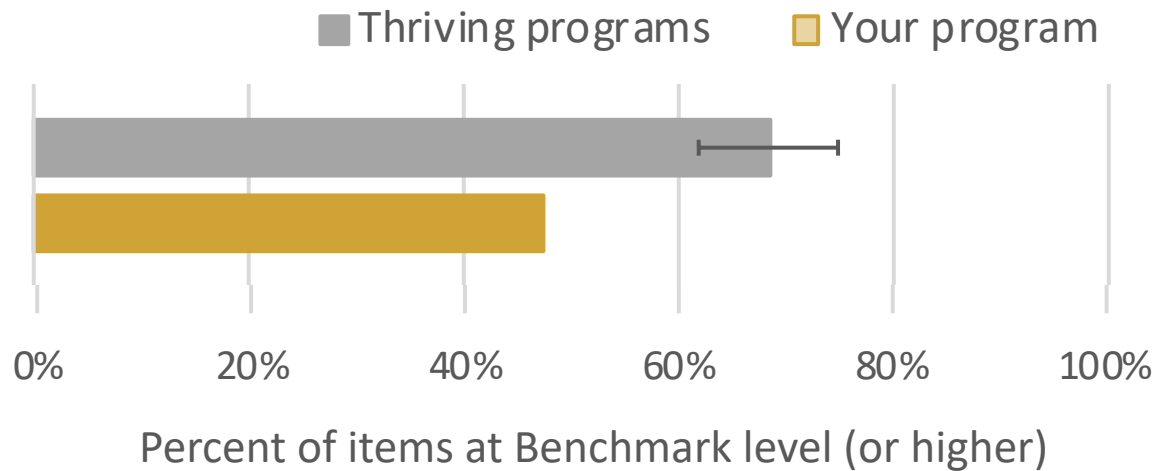
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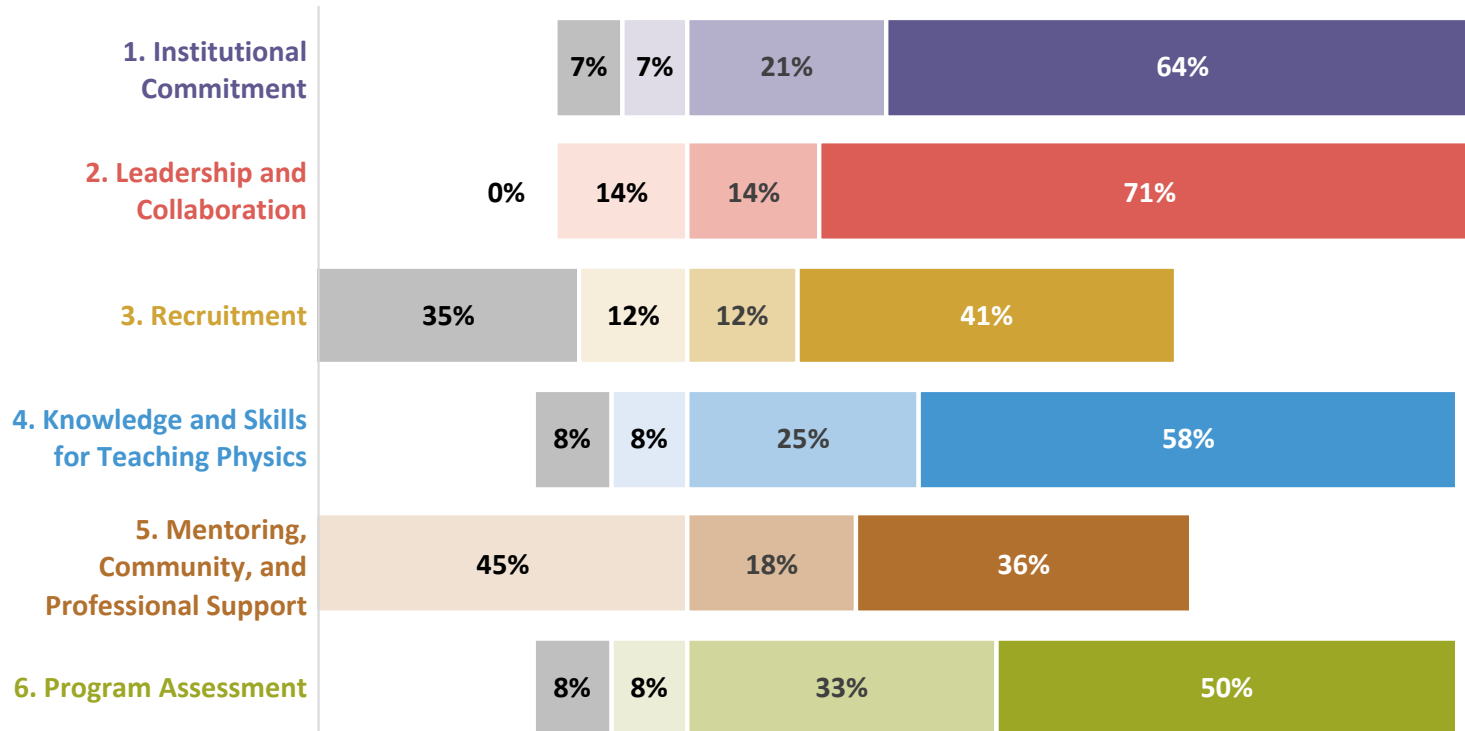
Visuals rely on percent “at least Benchmark”

Compare to other programs, last year's data, etc.

Standard 3: Recruitment



Allows for aggregation across programs



The end result is an instrument that...

- **Characterizes the practices and structures** observed at thriving physics teacher education programs.*
- **Provides a specific, objective, and reliable guide** for physics teacher educators seeking to improve their programs.
- **Supports research** on physics teacher education programs.

**The PTEPA Rubric focuses on areas specific to physics teacher education, avoiding areas in the sole domain of the school of education.*



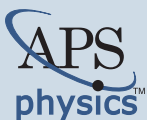
Thank you!



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- phystec.org/THRIVING



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