Should there be accreditation of undergraduate physics programs?

Michael Jackson, Co-chair, Best Practices for Undergraduate Physics Programs Task Force
1-Minute Exercise

- Take a piece of paper
- Write one or two challenges facing your department
- Pass the paper to the aisles
- The common challenges are:
Physics Bachelor Degrees

www.aps.org/programs/education/statistics/compare.cfm
BPUPP: Brief Timeline

STB*: Requests to APS to do what ACS does: Program Certification

2012: APS leadership asks to investigate

2013: Working group formed to investigate

2014: Survey of physics chairs, report written

2015: Committee on Education (COE) discusses, and makes recommendation to APS Council; ABET announces intention to accredit all science fields

2015: APS Council charges COE to form task force

2016: COE begins process, drafts preliminary documents, recruits task force

2016: Task force starts meeting

2017: Applied for funding, beginning drafts and discussions on underlying issues

*Since Time Began
1. Develop a guide for self-assessment of undergraduate physics programs founded on documented best practices linked to measurable outcomes

   The guide should provide a physics-community-based resource to assist programs in developing a culture of continuous self-improvement, in keeping with their individual mission, context, and institutional type. The guide should include considerations of curricula, pedagogy, advising, mentoring, recruitment and retention, research and internship opportunities, diversity, scientific skill development, career/workforce preparation, staffing, resources, and faculty professional development.

2. Recommend a plan for ongoing review and improvement of this guide under the oversight of the APS Committee on Education
APS BPUPP Task Force Members

Co-Chair: David Craig, Le Moyne College
Co-Chair: Michael Jackson, Millersville University of Pennsylvania

- Noah Finkelstein, University of Colorado Boulder
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- Ramon Lopez, University of Texas at Arlington
- Willie Rockward, Morehouse College
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- Carl Wieman, Stanford University
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Project Manager: Sam McKagan
Staff Liaison: Ted Hodapp; Task Force Support: Miranda Bard
AAPT Liaison: Bob Hilborn

www.aps.org/bpupp
What BPUPP is Doing

Designing a process to help department chairs with:

• Periodic program assessment (departmental review)
• Improve usefulness of assessment
• Bring together known literature on topics, and practices recognized by the community as effective when there is insufficient evidence-based knowledge about topics
• Encourage discussions in departments on continuous improvement of physics major using evidence-based methods
• Provide a leverage point for departments to advocate for resources to improve the major
• Engage PER community on departmental needs
Tentative Structure of Guide

- Executive summary and introduction,
- How to navigate and use the guide,
- Development and implementation of program self-assessment and review plans and processes, and
- Common Goals faced by physics departments that includes:
  - Prepare students for diverse careers
  - Increase number of graduates
  - Improve program pedagogy
  - Increase diversity and inclusion
  - Improve student success & satisfaction
  - Develop, review and assess (program) curricular and degree program offerings
  - Develop, implement and maintain effective cycle of program improvement
  - Develop and implement strategic planning processes and evaluate program constraints and resources
  - Prepare for departmental review and accreditation
  - Improve professional environment for faculty
  - I’m a new chair. Help! (New employee orientation)
  - Enhance departmental leadership and organization.
Guide to self-assessment

Planned elements

- Why? [Regional accreditation, …]
- Strategic planning
- Creating vision and mission statements
- Designing and sustaining program assessment plans
- Creating program student learning objectives
- Creating course-level student learning objectives
- Program structure
- Preparing for external program review
- Preparing for [e.g.] ABET accreditation
Section developed on known practices related to UR (focusing on retention and student success)
Section Template

1. Two sentence description/overview - what is this section about?
2. What goals are these best practices helping the department achieve? Why should departments be interested in this section?
3. List of known best practices. For each practice:
   a. Principles behind the practice.
   b. Contextual factors for the practice. This includes unique settings for which the practice is ideal, identifying obstacles related to the practice, and when possible including a cost/benefit analysis.
   c. Implementation strategies for the practice that includes references, identifying other relevant sections of the guide, etc.
   d. Relevant assessments associated with the practice.
4. Relevant assessments (relevant to all practices; assessments specific to a particular, individual practice were embedded in step 3.d).
5. Connections to other sections (i.e. other groups of best practices). This includes sections of the guide already identified in step 3.c as well as any other sections connected to this global set of best practices outlined in step 3.
6. References.
Guide Timeline

2017: Initial drafts; external input on drafting sections; external section reviews by invited department chairs and experts in the field

2018: Limited release of first sections; feedback from community; continued development and feedback

2018: Begin workshops on use of guide; training of departmental reviewers

2019: Release of entire (1st edition) of guide; continued workshops

2020: First review by COE to update/improve content, updating of review procedures to ensure fidelity of design principles
References

SPIN-UP 2002 (enrollment):
    aps.org/programs/education/undergrad/faculty/spinup/

T-TEP 2012 (teacher education):
    phystec.org/webdocs/TaskForce.cfm

Phys21 2016 (careers):
    compadre.org/phys21/

Vision and Change 2011 (biology):
    visionandchange.org

Active learning:
Feedback and Discussion
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