Implementation Guide by Adrian Madsen

Table of Contents

Implementation
- Purpose of the PSEQ
- Course Level: What kinds of courses is it appropriate for?
- Content: What does it assess?
- Timing: How long should I give students to take it?
- Example Questions
- Access: Where do I get the assessment?
- Versions and Variations: Which version of the assessment should I use?
- Administering: How do I give the assessment?
- Scoring: How do I calculate my students’ scores?
- Clusters: Does this assessment include clusters of questions by topic?
- Typical Results: What scores are usually achieved?
- Interpretation: How do I interpret my students’ scores in light of typical results?

Resources
- Where can I learn more about this assessment?
- Translations: Where can I find translations of this assessment in other languages?

Background
- Similar Assessments
- Research: What research has been done to create and validate the assessment?
  - Research Validation
  - Research Overview
- Developer: Who developed this assessment?

References
Implementation

Purpose of the PSEQ
To measure students’ self-efficacy in their physics course.

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

Content: What does it assess?
Beliefs / Attitudes (self-efficacy)

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

Example Questions
Sample statements from the PSEQ:
I generally manage to solve difficult physics problems if I try hard enough

\[\text{Strongly Disagree} \; 1 \; 2 \; 3 \; 4 \; 5 \; \text{Strongly Agree}\]

I know I can stick to my aims and accomplish my goals in physics

\[\text{Strongly Disagree} \; 1 \; 2 \; 3 \; 4 \; 5 \; \text{Strongly Agree}\]

Access: Where do I get the assessment?
Download the assessment from physport at www.physport.org/assessments/PSEQ.

Versions and Variations: Which version of the assessment should I use?
The latest version of the PSEQ, released in 2011, is version 1.

Administering: How do I give the assessment?
- Give it as both a pre- and post-test. This measures how your class shifts student thinking.
  - Give the pre-test at the beginning of the term.
  - Give the post-test at the end of the term.
- Use the whole test, with the original wording and question order. This makes comparisons with other classes meaningful.
- Make the test required, and give credit for completing the test. This ensures maximum participation from your students.
- Tell your students that the test is designed to evaluate the course (not them), and that knowing how they think will help you teach better. Tell them that correctness will not affect their grades (only participation). This helps alleviate student anxiety.
- For more details, read the PhysPort Guides on implementation:
  - PhysPort Expert Recommendation on Best Practices for Administering Belief Surveys
    (www.physport.org/expert/AdministeringBeliefSurveys/)

Scoring: How do I calculate my students’ scores?
- Strongly disagree is coded as 1, disagree as 2, neutral as 3, agree as 4, and strongly agree as 5. Each student’s response is summed over all 5 items. Physics self-efficacy scores range between 5 (lowest) and 25 (highest).
- See the PhysPort Expert Recommendation on Best Practices for Administering Belief Surveys for instructions on calculating shift and effect size (www.physport.org/expert/AdministeringBeliefSurveys/)
Use the PhysPort Assessment Data Explorer for analysis and visualization of your students' responses [www.physport.org/explore/SOSESCP](http://www.physport.org/explore/SOSESCP)

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

There are no clusters of questions on the PSEQ.

**Typical Results: What scores are usually achieved?**

Typical scores on the PSEQ from Lindstrøm and Manjula, 2011:

<table>
<thead>
<tr>
<th>Gender</th>
<th>Class</th>
<th>Early semester 1</th>
<th>End semester 1</th>
<th>Early semester 2</th>
<th>End semester 2</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
</tr>
<tr>
<td>Female</td>
<td>FND</td>
<td>51</td>
<td>17.76</td>
<td>3.12</td>
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<td></td>
<td>REG</td>
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<td>18.06</td>
<td>3.54</td>
<td>59</td>
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<tr>
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<td>19.90</td>
<td>2.91</td>
<td>52</td>
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<tr>
<td></td>
<td>REG</td>
<td>125</td>
<td>19.20</td>
<td>2.65</td>
<td>94</td>
</tr>
</tbody>
</table>

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

It is hoped that students' PSEQ scores improve as a result of your course or at least do not decrease from pre- to post-test. Aim for positive shifts in scores from pre- to post-test. You can also compare your PSEQ scores to those listed in Typical Results. The test developers found that PSEQ scores varied by gender, with males having higher PSEQ scores than females.

**Resources**

Where can I learn more about this assessment?


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

We don't have any translations of this assessment yet.

If you know of a translation that we don't have yet, or if you would like to translate this assessment, please contact us!

**Background**

**Similar Assessments**

The SOSESC-P has 33 questions, whereas the PSEQ and SEP have 5 and 8 questions, respectively, so the SOSESC-P probes more dimensions of self-efficacy in more depth than the other surveys. There is a lot more variety in the questions on the SEP than the questions on the PSEQ. The SEP asks students about their belief that they can solve very specific physics problems, their comfort using a computer, and if they consider themselves good at mathematics, whereas the PSEQ questions are about physics in general. All have the same level of research validation

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

*Research Validation: Bronze* 🌟

This is the third highest level of research validation, corresponding to at least 3 of the validation categories below.
Research Overview

Most of the Likert-scale questions on the PSEQ are modified versions of questions from the General Self-Efficacy Scale (Schwarzer, 1993), while one PSEQ question was written by the developers. The five questions underwent expert review, and were revised. The PSEQ was then given to over 100 introductory physics students and appropriate analysis of reliability and validity were conducted. Further, an exploratory factor analysis was conducted which found that the five questions on the PSEQ make up one factor, as intended by the developers. A subsequent confirmatory factor analysis to further check the validity and reliability of the PSEQ was conducted with data from over 350 introductory physics students. The PSEQ was then given to introductory physics students four times over a year, and a consistent factor structure was again found. The PSEQ has been given to over 500 introductory physics students at one Australian university, and the results published in one peer-reviewed publication.

Developer: Who developed this assessment?

Christine Lindstrøm and Manjula Sharma

References


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