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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

Strongly Disagree 1 2 3 4 5 *Strongly Agree*

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

Strongly Disagree 1 2 3 4 5 *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/SOSESCEP)

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 3: The means and standard deviations (SD) of the self-efficacy scores for males and females in each class at each administration. Only students with no formal instruction in senior high school physics are included in the Fundamentals (FND) class, while only those with formal instruction in senior high school physics are included in the Regular (REG) class. The two classes were taught separately in first semester but merged into the Environmental class in second semester. The Fundamentals and Regular labels are retained to reflect students' senior high school physics experience.

Gender	Class	Early semester 1			End semester 1			Early semester 2			End semester 2		
		N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Female	FND	51	17.76	3.12	66	16.88	2.52	38	17.18	2.64	43	16.93	3.13
	REG	66	18.06	3.54	59	16.83	3.04	30	18.17	2.67	36	18.47	2.41
Male	FND	39	19.90	2.91	52	18.87	2.80	26	17.88	2.96	31	18.58	3.01
	REG	125	19.20	2.65	94	18.60	2.41	28	19.14	1.80	35	19.74	2.45

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?

C. Lindstrøm and M. Sharma, [Self-Efficacy of First Year University Physics Students: Do Gender and Prior Formal Instruction in Physics Matter?](#), Int. J. Innov. Sci. Math. Educ. **19** (2), 1 (2011).

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.

- Based on research into **student thinking**

- Studied using **student interviews**
- Studied using **expert review**
- Studied using **appropriate statistical analysis**
- Research conducted at **multiple institutions**
- Research conducted by **multiple research groups**
- Peer-reviewed publication**

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

- C. Lindstrøm and M. Sharma, [Self-Efficacy of First Year University Physics Students: Do Gender and Prior Formal Instruction in Physics Matter?](#) Int. J. Innov. Sci. Math. Educ. **19** (2), 1 (2011).