# PhysPort Implementation Guide: Undergraduate Research Student Self-Assessment (URSSA) Version 1



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downloaded from PhysPort.org

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# Implementation

## Purpose of the URSSA

To collect self-report data from students involved in an undergraduate research program in order for undergraduate research program administrators to evaluate student outcomes at the program-level.

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

Undergraduate research students

### Content: What does it assess?

Lab skills (Thinking and working like a scientist, Personal gains related to research work, Skills, Attitudes and behavior)

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

15-20 minutes

## **Example Questions**

Example questions from the URSSA:

1. How much did you GAIN in the following areas as a result of your most recent research experience?	no gains a	i little gain n	noderate gain	good gain g	great gain n	ot applicable
1.1 Analyzing data for patterns.	0	0	0	0	0	0
1.2 Figuring out the next step in a research project.	0	0	0	0	0	0
1.3 Problem-solving in general.	0	0	0	0	0	0
3. How much did you GAIN in the following areas as a result of your most recent research experience?	no gains	a little gain	moderate gai	n good gain	great gain	not applicable
<ol> <li>How much did you GAIN in the following areas as a result of your most recent research experience?</li> <li>Writing scientific reports or papers.</li> </ol>	no gains	a little gain	moderate gai	n good gain	great gain	not applicable
<ol> <li>How much did you GAIN in the following areas as a result of your most recent research experience?</li> <li>Writing scientific reports or papers.</li> <li>Making oral presentations.</li> </ol>	no gains	a little gain i	moderate gain	n good gain O O	great gain	not applicable
<ol> <li>How much did you GAIN in the following areas as a result of your most recent research experience?</li> <li>Writing scientific reports or papers.</li> <li>Making oral presentations.</li> <li>Defending an argument when asked questions.</li> </ol>	no gains	a little gain O O O	moderate gair	n good gain O O O	great gain O O O	not applicable

### Access: Where do I get the assessment?

Download the assessment from physport at www.physport.org/assessments/URSSA.

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

The latest version of the URSSA, released in 2012, is version 1.

## Administering: How do I give the assessment?

- The URSSA is given only as a post-test.
- Use the online survey tool at <u>www.salqsite.net</u> to administer the URSSA online.
- Use these instructions for setting up and administering the URSSA online using the SALG Site.
- Only use of the URSSA with groups of at least 10 undergraduate research students, in order to keep student responses anonymous.
- If the survey is administered online, there are four core groups of questions that are "locked" and cannot be altered or deleted. There are remaining items that are optional and can be deleted, moved, or edited. Those using the survey with a group of programs can lock additional questions they do not wish individual program directors to edit.

#### Scoring: How do I calculate my students' scores?

- Different question types on the URSSA are scored differently. There is no overall score on the URSSA.
- For the core items, (Thinking and working like a scientist, Personal gain, Skills, Attitudes and behaviors), take the mean value of the score (1-5) for each question, and the take mean of the questions in each core category.
- For the yes/no questions, you can look at the percentage of your students who answer yes.
- For short answer questions, no scoring is necessary.

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

There are four constructs in the URSSA: These include:

1) Thinking and Working Like a Scientist: focuses on understandings of the process of scientific research and the nature of scientific knowledge.

2) Personal Gains Related to Research Work: meant to assess affective characteristics of confidence, comfort, and general self-efficacy with conducting research and working on a research team and in a lab.

3) Skills: the closest to the traditional academic outcomes associated with more direct assessments. These skills, which are common across disciplines include writing scientific reports or papers, making oral presentations, and conducting observations in the lab or field.

4) Attitudes and Behaviors: focuses on attitudes and behaviors linked to working in a scientific community and feelings of creativity, independence, and responsibility around working on scientific projects.

Table 1 (from Weston and Laursen 2015) shows which questions correspond to each construct.



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

Comparison of biology research undergraduate experience (REU) students' URSSA mean scores with a matched sample of non-biology students who also participated in an REU, from <u>Weston 2013</u>. The results shown below are divided out by construct, where the constructs contained the "core" group of URSSA items. There were additional items on the version of the URSSA used by Weston, but the results are not reported here.

		BIO REU 2011	BIO REU 2012	Non-BIO REU
THINKING & WORKING LIKE A SCIENTIST	Mean	4.2*	4.17*	4.0*
	Standard Deviation	.67	.67	.7
	Valid N	304	372	1119
PERSONAL GAIN	Mean	4.32*	4.24*	4.1*
	Standard Deviation	.67	.69	.7
	Valid N	304	392	1115
SKILLS	Mean	3.88*	3.91*	3.7*
	Standard Deviation	.83	.76	.8
	Valid N	304	392	1113
ATTITUDES AND BEHAVIORS	Mean	4.22*	4.19*	3.9*
	Standard Deviation	.73	.72	.8
	Valid N	304	395	1105

Table 6 Comparison of BIO REU years with matched sample: 2011 - 2012

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

- You can look at your mean scores on the four categories of core items, where a higher mean score in a category means your students self-reported more favorably in that category, e.g., a higher mean score in the personal gain category indicates that your students reported a higher personal gain as the result of your program.
- You can compare the mean scores on the four groups of core items between groups of undergraduate research students. For example, you could compare your program before and after you made a change to it.
- You can also look at the percentage of students who answer "yes" to the yes/no questions, and track the changes over time as your work to change and improve your program.

## Resources

### Where can I learn more about this assessment?

T. Weston and S. Laursen, <u>The Undergraduate Research Student Self-Assessment (URSSA)</u>: Validation for Use in Program <u>Evaluation</u>, CBE Life. Sci. Educ. **14** (3), 1 (2015).

### 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

There is also the Survey of Undergraduate Research Experiences (SURE) by David Lopatto.

# 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 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

The questions on the URSSA were based on longitudinal interviews of 76 students about the benefits and learning gains they experienced through undergraduate research activities. A sample of 80 faculty were also interviewed about working with the undergraduate research students. Using the interview findings, the developers created a survey blueprint, wrote items and reviewed the survey with their advisory board. The survey was them piloted with students using think around interviews, and revised. The underlying structure of the survey was assessed with confirmatory factor analysis and the developers found the four components of the survey represent separate but related constructs. Average scores from item blocks formed reliable but moderate to highly correlated to ratings of satisfaction with external aspects of the research experience. The pattern of correlation among individual items suggests that items asking students to rate external aspects of their environment were more like satisfaction ratings than items that directly ask about student skills attainment. Finally, survey items asking about student aspirations to attend graduate school in science reflected inflated estimates of the proportions of students who had actually decided on graduate education after their UR experiences. As of May 1, 2014, 3671 students had taken the URSSA across the United States and Canada. The URSSA results are published in eight peer-reviewed publications.

#### Developer: Who developed this assessment?

Tim Weston, Sandra Laursen, Anne-Barrie Hunter & Heather Thiry

# References

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- T. Weston and S. Laursen, <u>The Undergraduate Research Student Self-Assessment (URSSA)</u>: Validation for Use in <u>Program Evaluation</u>, CBE Life. Sci. Educ. **14** (3), 1 (2015).