

# ASSESSMENT OF UNDERGRADUATE RESEARCH AT A PRIVATE LIBERAL ARTS COLLEGE

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## INTRODUCTION

This poster describes the work of a four-year private co-educational institution to develop a meaningful and sustainable assessment plan for undergraduate research. Congruent with increased opportunities available to students, the institution has begun to assess student learning and engage in program evaluation, assessing satisfaction with undergraduate research activities, and disseminating findings to faculty and administrators.

The assessment plan for the Office of Undergraduate Research seeks to accomplish the following goals: i) provide a count of undergraduate research, scholarship and creative activities at Concordia, ii) assess learning achieved in undergraduate research experiences, iii) evaluate the effectiveness of the Office of Undergraduate Research.

## COUNTING UNDERGRADUATE RESEARCH, SCHOLARSHIP AND CREATIVE ACTIVITY

### Faculty surveys of individually-mentored research and classroom-based research

- Administered by the Office of Institutional Research
- Faculty self-report student participation in undergraduate research, outcomes of the research and sources of funding
- Requires active faculty participation

### Department chair survey of off-campus research experiences

- Administered by the Office of Institutional Research
- Department chairs report participation of their majors in off-campus undergraduate research

- Assumes department chairs are aware of student participation

### Year-end report completed by the Director of Undergraduate Research

- Provides a count of UR grant support and travel funding administered by the Office of Undergraduate Research, and student participation in on-campus Celebration of Student Scholarship
- Demographic information and majors/minors are reported

### Directed research course enrollments

- Campus participation in Directed Research course will be evaluated

### Student authored or co-authored research publications

- Papers shared in the institutional repository
- Other information on student presentations and publications determined in the faculty survey

## ASSESSMENT OF STUDENT LEARNING AND EVALUATION OF RESEARCH PROGRAMMING

Students who engage in undergraduate research are expected to achieve some of the following learning goals/objectives. The student is able to

- formulate questions in their field,
- demonstrate ability to understand literature in their field of study,
- explain methodology,
- demonstrate proficiency in the use of the tools and instruments of the area of study,
- analyze and interpret literature and/or results as appropriate to their field of study,
- demonstrate ability to communicate (writing, presenting) within the area of study, and
- demonstrate high standards of research ethics.

Each research experience may meet these learning goals/objectives with more or less emphasis. Learning outcomes adapted from Lapotto (2010) and Laursen, Hunter, Seymour, Thiry & Melton (2010).

### ASSESSMENT OF SUMMER RESEARCH PROGRAM

**Student surveys:** In-house self-report assessment of learning gains and confidence; responses to open-ended question about learning outcomes; evaluation of the degree to which students met the goals in the learning agreement they sign with their mentor at the start of the summer. Science students complete David Lapatto's Survey of Undergraduate Research Experiences (<http://www.grinnell.edu/academic/csla/assessment/sure>).

**Faculty mentor survey:** Faculty rate their student's learning gains and respond to an open-ended question. Mentors are also asked the degree to which their students met the learning agreement goals.

Faculty and students rate their satisfaction with the summer program activities.

### ASSESSMENT OF CELEBRATION OF STUDENT SCHOLARSHIP

**Student survey:** A yearly survey completed by student presenters evaluates the success of the our campus event and asks students to report learning gains associated with their undergraduate research experience.

These are the same questions used for our summer research students.

**Faculty survey:** A yearly survey completed by mentors of student presenters evaluates our campus event and asks faculty to assess the learning gains associated with their student's research experience.

### PUBLICATIONS AND PRESENTATIONS

Count of students who presented their work at professional meetings or published their findings, as direct evidence that some SLO for UR were achieved.

## STUDENT LEARNING OUTCOMES: SUMMER 2012

**Table 1: How much did you GAIN as a result of your summer research experience?** Data are reported as group means and standard deviations. Percentages represent the percent of students who indicated a particular learning gain.

	No gain	A little	Moderate	Good	Great
<b>Formulating research questions</b>					
All summer research students mean=3.77, SD=1.09		19%	13%	39%	29%
Research students completing 1 <sup>st</sup> year: mean=3.90, SD=.99		10%	20%	40%	30%
Mentors of 1 <sup>st</sup> year students: mean= 3.78, SD=.97		11%	22%	44%	22%
<b>Understanding scientific and/or mathematics literature</b>					
All: mean=4.16, SD=.93		10%	6%	42%	42%
1 <sup>st</sup> year: mean=4.30, SD=.95		10%		40%	50%
1 <sup>st</sup> yr mentors: mean=3.78, SD=.97		11%	22%	44%	22%
<b>Ability to explain research designs and methodology</b>					
All: mean=4.16, SD=.93		6%	13%	42%	39%
1 <sup>st</sup> year: mean=4.30, SD=.95		10%		40%	50%
1 <sup>st</sup> yr mentors: mean=3.78, SD=.97		11%	22%	44%	22%
<b>Proficiency in the use of the tools and instruments in your area of study</b>					
All: mean=4.13, SD=.88			13%	29%	58%
1 <sup>st</sup> year: mean=4.80, SD=.42				20%	80%
1 <sup>st</sup> yr mentors: mean=3.78, SD=.83			44%	33%	22%
<b>Analyzing data &amp; interpreting results</b>					
All: mean=4.45, SD=.72		10%	19%	35%	32%
1 <sup>st</sup> year: mean=4.00, SD=1.05		10%	20%	30%	40%
1 <sup>st</sup> yr mentors: mean=4.56, SD=.53			33%	33%	33%
<b>Communicating (writing, presenting) within your area of study</b>					
All: mean=3.87, SD=1.02		6%	19%	45%	26%
1 <sup>st</sup> year: mean=3.86, SD=1.05		10%	20%	30%	40%
1 <sup>st</sup> yr mentors: mean=4.00, SD=.87			56%	22%	22%
<b>Understanding research ethics</b>					
All: mean=3.77, SD=1.18	6%	6%	23%	32%	32%
1 <sup>st</sup> year: mean=4.00, SD=1.05			30%	40%	30%
1 <sup>st</sup> yr mentors: mean=3.67, SD=.87		11%	22%	56%	11%

**Table 2: Meeting learning agreement goals**

Students were also asked review the learning agreement that they signed with their mentor at the beginning of the summer and reflect on learning gains related to it. Data were reported on scale of 1-5 with 5 being a "great gain."

Considering your learning agreement, rate your learning gains for the goals specified in the agreement.	Mean	S.D.
All Concordia students	3.96	.96
STEP and other 1 <sup>st</sup> year students	4.40	.52
STEP mentors evaluation of their students	4.11	.86

**Table 3: Overall impression of summer program activities.**

Students were asked to rate their overall impression of the summer program activities, including activities planned by their department and the Office of Undergraduate Research. Students responded to a 1-5 scale, with one being "not at all" and 5 being "very much."

Impression of summer activities	Mean	S.D.
How useful were the summer program activities?	3.65	.63
How enjoyable were the summer program activities?	3.88	.71

## DISSEMINATION OF ASSESSMENT AND PROGRAM EVALUATION DATA

- The Office of Institutional Research shares data from the undergraduate research survey with faculty and administrators each year
- The assessment of student learning data is summarized and shared with summer research students and faculty mentors, as well as division chairs, dean and provost, each winter
- Assessment of Celebration of Student Scholarship, our on campus symposium for undergraduate research, data are shared with participants and faculty mentors, as well as the event planning committee
- Periodic reports included in the assessment newsletter and other on-campus venues.