

Extended Science Workshop (ESW): Enhance student learning in Organic Chemistry

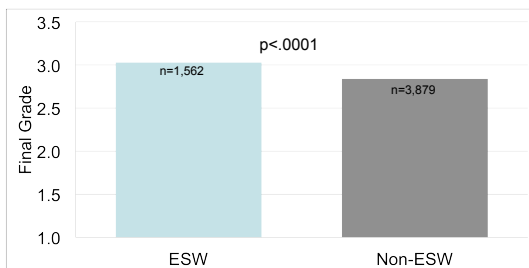
- **Goal:** Improve student performance and retention in Organic Chemistry sequence
- **Structure:** Weekly 2hr small group workshop led by advanced peer facilitators
- **Activities:** Collaboratively solve challenging conceptual problems developed by course professor; Share study strategies

ESW Participation

	2005-6	2006-7	2007-8	2008-9	2009-10
Fall	99	93	104	141	129
Winter	81	73	93	72	106
Spring	49	41	62	74	93

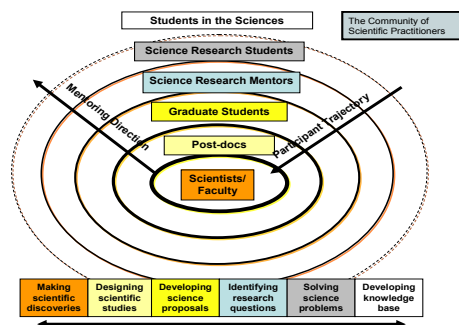
ESW Impact (2005-2010): Final Grades in Organic Chemistry

43.3% of ESW students received a final grade of B+ or higher, compared to 36.2% of non-ESW students. This difference is statistically significant.



ESW Impact (2005-2010): Course Retention in Organic Chemistry

After adjusting for prior GPA, sex and ethnicity, the odds of being retained in the entire sequence for ESW students are 1.7 times higher than non-ESW students.



Student Feedback: ESW & SRW

"I received comments after my first quarter of GSW saying that one of my students learned more in the GSW setting about organic chemistry than they did in all of lecture and the textbook combined." – *ESW facilitator*

"I really learned how to problem solve and work through the problems in the best way possible. It taught me how to think like an Organic Chemistry student..." – *ESW student*

"...I would definitely not have been able to receive funding without its (SRW's) guidance and advice throughout the year... and I think what was most useful was the step-by-step approach it took in helping us learn, which took the pressure off tackling the entire research and grant application process at once..." – *SRW student*

"...If it had not been for the program I may have never set my foot into a lab (or would have had a lot more trouble doing so)... It gave me a glimpse of an area of "science" I have not seen before..." – *SRW student*

Sustainability

- Northwestern has committed financial support for continuing ESW
- For-credit course modeled after SRW will be offered to freshmen next year
- External funding (HHMI) has been awarded to continue SRW; and Internal grants are pending

Opportunities & Challenges

- Expand the SRW model into other disciplines
- Increase participation of underrepresented students
- Secure more funding for supporting summer research
- Cultivate a culture that accepts relatively novice students into the broader research community

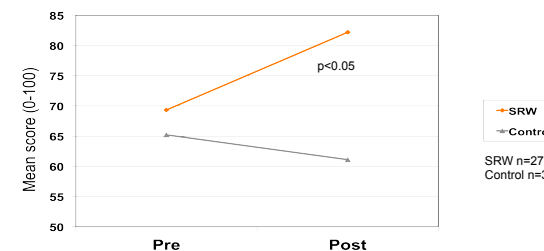
Science Research Workshop (SRW): Engage students in scientific research

- **Goal:** Engage students in authentic research experience early on to encourage persistence in science and/or research careers
- **Structure:** 1) Placement in science labs; 2) Weekly 1.5hr session that includes "faculty café" (0.5hr) and small group workshop led by advanced peer facilitators
- **Activities:** 1) Participate in regular lab activities; 2) Develop an independent research project, and write a proposal for Northwestern's Undergraduate Research Grant competition; 3) If funded, carry out the study in the lab

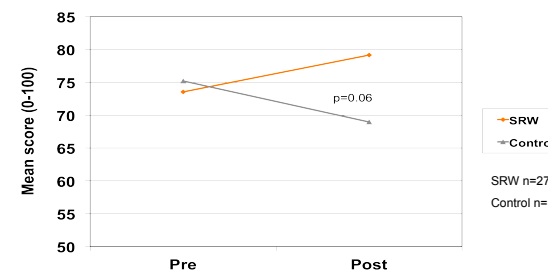
SRW Participation

Program year	Completed program	Submitted proposal	Received funding	Worked in summer lab
2007-8 (Pilot)	18	11	11	11
2008-9	22	19	16	16
2009-10	21	21	20	20
2010-11	21	21	Pending	Pending

SRW Impact (2007-2009): Research Self-Efficacy – Conceptualization Subscale



SRW Impact (2007-2009): Research Self-Efficacy – Early Tasks Subscale



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