SEARLE CENTER FOR TEACHING EXCELLENCE
ANNUAL REPORT 2011–2012

CONTENTS

INTRODUCTION

Through its wide range of programs, services, research and scholarship, the Searle Center for Teaching Excellence seeks to assist all members of the Northwestern community who are engaged in the promotion and facilitation of "cutting edge" learning of their students and colleagues – including faculty, post-docs, graduate TAs and instructors, and under-graduate peer mentors, clinicians, and administrators. Through its research and publications, the Center also engages in broad national and international conversations about what constitutes excellence in learning and teaching, and seeks to share new knowledge with those who teach and facilitate learning in higher education.

The Searle Center is composed of four major spheres of activity: Faculty Programs, Graduate Student Programs, Undergraduate Programs, and Research & Evaluation projects, with an Associate Director leading each of these areas. In each of the first three spheres we provide seminars, talks & workshops, designed to provide information and practical guidance on specific topics of learning and teaching, as well as long-term programs designed to prompt more profound changes in participants, such as our year-long Searle Fellows faculty program, our Graduate Teaching Certificate program, and our Gateway Science Workshop program. We also provide a wide variety of linked services, including individual consultation and classroom analysis, as well as resources, including an extensive collection of books on teaching and learning housed in our Center Library. In the research and evaluation sphere, we collaborate with faculty and on a wide variety of disciplinary and cross disciplinary projects. These range from smaller projects, with individual faculty experimenting with new teaching techniques, to evaluation of large NSF- and NIH-funded programs.

2011–2012 Highlights

In the past academic year we continued to extend the work arising from the strategic plan we developed in 2010 and began implementing the several funded projects we had won in the previous year. As a result we have, once again, seen innovation in our programs and projects, and growth in participation of faculty and graduate and undergraduate students in them.

- In our faculty development area, for example, we provided eight programs and integrated series of short workshop courses for faculty across the university as well as three workshop courses for individual schools and colleges. Included in this past year were two new programs: the nuViBE faculty development and the Critical Thinking in STEM initiatives.
- In our graduate student area, robust collaboration with the graduate school once again resulted in participation of more than 300 grad students in the our new TA conferences and over 66 senior grad students in the Graduate Student Certificate program. Included during this past year was a new program: the NU Bioscientist Mentoring Program.
- In the undergraduate area our collaboration with Academic Advising extended the programs for training peer tutors and allowed us to provide small-group tutoring for 153 undergraduate students. Along with the continuing success of the GSW program (over 1250 registrations) and the Science Research Workshop, we are now training and working with 140+ undergraduate peer facilitators and mentor/instructors.
- In our funded projects, in addition to having successfully implemented and collaborated on implementing projects from Howard Hughes Medical Institute (HHMI), The National Science Foundation (NSF), and AmidEast (funded by USAID), we currently have 18 research/evaluation projects and collaborations with faculty and schools. In addition we have approximately 5 projects and collaborations in submission for external funding.

But this description just touches the surface of the Center's output during the past year. I urge the reader to look at the information provided below in more detail.

— Greg Light, Director

PROGRAMS

The Searle Center provides a variety of programs for faculty, graduate students, and undergraduate students. These range from one-off workshop sessions to year-long programs designed to change participants' approach to teaching.

PROGRAMS FOR FACULTY

Substantial, longer-term programs

NEW Critical Thinking in STEM (CTIS)

(NSF: Course, Curriculum and Laboratory Improvement (CCLI) award $227,000 over 3 years). This project is a collaboration between the Searle Center and the City Colleges of Chicago (CCC) to design, pilot, and study a Science, Technology, Engineering, and Mathematics (STEM) faculty development program focused on improving higher order learning outcomes of STEM students. Nineteen faculty – 10 faculty from CCC and 9 from Northwestern are participating in the project and are aiming to improve the critical thinking of students in one undergraduate STEM class that they teach. The Critical Thinking Assessment Test (CAT) was administered to students at the beginning and end of the quarter/semester to measure the gains that students typically make in critical thinking. Gains in critical thinking were also assessed using course specific questions developed by faculty. Faculty reviewed the CAT data and the data from their own assessments at workshops in May and June. They are developing new activities to enhance critical thinking over the summer and will implement them in their class in the new academic to see if they result in larger gains on the CAT test and course specific measures of critical thinking.

nuViBE Faculty Development Project

Intro BiolSci Faculty members teaching the large introductory biology classes (~500 students per year) participated in a year-long, discipline-specific faculty development program in 2011-2012. This program was funded by an institutional grant on undergraduate education from HHMI and was coupled with the revision of the introductory biology course sequence at Northwestern University. Participants included seven tenured or tenure-track members, two lecturer faculty, one research assistant professor, and 11 teaching fellows (postdoctoral fellows and graduate students). Faculty participated in a series of workshops and a full-day retreat to develop evidence-based pedagogical methods for their teaching. Workshops were generally well received, based on online surveys administered after each event (response rate of approximately 50%). From participant comments, a few common themes emerged as positive elements of these workshops: 1) examples of active learning strategies with clear plans for implementation (10/27 responses), 2) workshop activities that engage participants with the ideas presented (10/27 responses), and 3) discussions among colleagues (8/27 responses). Faculty and teaching fellows also indicated that they would like more information on how to implement active learning and non-traditional assessments in large classrooms (10/19 responses). After the workshop series, faculty divided into specific biology disciplines and met periodically in small groups with a curriculum development specialist (with training in both biology and pedagogy) to develop their new courses. In addition, faculty groups presented ideas for their new courses in peer-review meetings. The first new course in the introductory biology sequence was offered in spring 2012 by two of the participating faculty members, which provided an opportunity for practice and reflections for the faculty development program. Course development activities will continue for other new courses that will be offered in 2012-2013, and BiolSci 215 will be revised based on experience from the first year.

Searle (Junior) Fellows Program

The Searle Fellows program is a comprehensive, year-long (eight month) faculty development program for pre-tenure, early career faculty. The program seeks to provide faculty with the expertise and knowledge to critically assess and solve problems in their courses. To participate in the program, applicants must provide a description

of a teaching project related to a course they teach. In most cases, faculty are nominated for the program by deans or department chairs and self-select in or out according to their ability to participate in all program events. The program has two main objectives: (1) to strengthen the participants' knowledge, understanding, and expertise in learning and teaching; and (2) to help them develop a project that will foster deep student learning. These projects usually focus on the development of a new course or curriculum, the revision of an existing course or curriculum, or the revision of a key assessment strategy in a course, curriculum, or other learning context. During the year, faculty participate in 4 dinner meetings, an overnight retreat in fall, a full-day retreat in spring, 3-4 workshops, 3 project meetings, evaluation activities (small group analysis of their class etc.), development of a project related to a course they are teaching. Fellows must communicate their project findings and reflections through a written critical account, a group poster, and presentation at the final celebratory dinner. Rick McGee, associate dean for faculty affairs in the medical school, helps facilitate the program. The Feinberg Academy of Medical Educators (FAME), led by Jon Lomasney, also participated in the selection of Searle Fellows from Feinberg. This year, 16 early-career tenure-line faculty completed the full program. Sixteen senior faculty served as their mentors. Of these, 5 were returning mentors, and 1 was a former Fellow. In the upcoming year, we plan to add a "capacity-building" element to the program, where faculty (especially those in FSM) will develop roundtables and workshops for their home departments.

Shorter, One-Off Sessions

Faculty Workshop Series

We offered 14 workshops this year, focusing on a range of topics including general course design, lecturing in large classes, promoting relevance in teaching, writing the pedagogical component of a grant proposal, promoting critical thinking, assessment and grading, and course evaluation. Two of these workshops were offered on the Chicago campus to accommodate the large number of Feinberg faculty interested in attending our programs. An average of 9 faculty members attended each session, representing a wide range of schools and departments. Responses to the workshops were positive; the average overall rating on post-workshop evaluation forms was 4.2 out of 5. Please see Appendix for a listing of all workshops and participant numbers.

New Faculty Workshop

This year, we returned to our standard format to introduce new faculty to teaching and learning at Northwestern. This full-day interactive session featured an overview of designing learning objectives, promoting active learning, and assessing student learning. During the sessions we incorporated "clickers" to engage the participants more fully. We also offered a session with Academic Research and Technologies staff, one resource panel with undergraduates, and one with representatives from various campus divisions (CAPS, Athletics, disabilities, and academic integrity), and a student panel. 39 new faculty participated in the program.

Special Topics Brownbags

We offered 3 roundtables to promote dialogue about three special topics, collaborating with different units to connect with faculty and graduate students with whom we might not otherwise contact.

- Teaching in a Globalized Classroom. In collaboration with the International Office, the Searle Center hosted a roundtable focusing on teaching in a globalized classroom. 17 people (faculty/grad) attended.
- Engaging Diverse Learners. In collaboration with our visiting colleagues from An-Najah University, we held a discussion focusing on best practices in engaging students with different backgrounds and levels of

experience. Approximately 12 people attended.

- Discussing Difference: Teaching Sensitive Topics to a Diverse Student Population. In collaboration with Sara Armstrong and Ramon Rivera-Servera from Performance Studies. 24 people (faculty, grad & staff) attended.

Teaching, Learning & Technology (TLT) workshops

In collaboration with Academic and Research Technologies, we offered three stand-alone workshops (intended for faculty and graduate students), including "Teaching with Social Media" (facilitated twice by Dan Gruber, an assistant professor in Medill, once on Evanston campus, once on Chicago campus), and "Engaging Students with Clickers." We had approximately 50 participants overall (faculty/staff, graduate students, and post-docs). Since Academic and Research Technologies was being restructured this year, we are developing new technology and teaching offerings for the upcoming year. We are also developing new online offerings, so that faculty will be able to participate remotely. We are currently developing "Designing Learning Outcomes" to be piloted in Fall 2012.

University Teaching Roundtables (UTR)

The UTRs are sponsored by the provost and hosted by the Searle Center for Teaching Excellence. Each roundtable–meant to be an interdisciplinary forum exploring current topics in teaching and learning–is led by a Charles Deering McCormick Professor of Teaching Excellence, a McCormick Distinguished Lecturer, or an Alumnae of Northwestern Teaching Professor, the highest awards for teaching offered by the university. Recipients are appointed as fellows of the Searle Center and contribute to Searle events. This year, 6 award recipients attended a luncheon with Searle Center staff and led discussions for faculty through the University Teaching Roundtables. Please see Appendix for details.

Specialized Workshops and Sessions

We also conducted specialized workshops and sessions for FSM, WCAS and McCormick, tailored to the needs of individual departments and programs. See Appendix for details.

PROGRAMS FOR GRADUATE STUDENTS

The Center runs a number of programs for graduate students to support their development as teachers throughout their graduate career. We train graduate students as new TAs, offer continuing support as they develop their approach to and practice of teaching, and provide extensive preparation for teaching at the college and university level. Please see the Appendix for more detailed information on participation in and evaluation of these programs.

New TA Conference

This one-day conference, held every fall the week before classes begin, prepares graduate students for their first teaching experiences as TAs. This year the conference included 15 discipline-specific workshops to orient TAs to their roles and responsibilities, as well as 11 sessions on topics such as preparing for the first day of class and teaching with technology. All workshops are developed and facilitated by trained graduate students, known as Teaching Assistant Fellows (TAFs) and Graduate Teaching Fellows (GTFs).

305 new TAs attended this past September. On a 5-point scale, the average evaluation rating for the conference sessions was 4.3.

Graduate Workshop Series

To provide continuing support to TAs and graduate students generally, we offer interactive workshops throughout the year. Workshops are developed and facilitated by Center staff as well as trained Graduate Teaching Fellows. This year we offered 12 workshops on topics such as "Marketing Your Teaching" and "Working with Student Writing." 166 graduate students attended throughout the year, with a range of 5-37 students at each session. On a 5-point scale, the evaluation average for this series was 4.4.

Teaching Assistant Fellows (TAF) and Teaching Consultants (TC)

The TAF program provides the opportunity for graduate students to develop and implement workshops on teaching and learning at the New TA Conference (see above). They are trained in facilitating teaching and learning workshops, and develop their sessions over the summer. 11 TAFs participated this year. Outstanding TAFs are appointed as Teaching Consultants and receive further training in classroom practice and observation. They conduct Small Group Analyses (SGAs) for faculty and graduate students. We employed 11 TCs this year.

Graduate Teaching Certificate Program

This twelve-month program prepares graduate students to teach at the university level through workshops, seminars, a course design project, and the development of a teaching portfolio. It is the only program at the Center that offers a Certificate of Achievement to acknowledge that work is evaluated by Center staff. The Center and The Graduate School jointly funded 6 part-time Graduate Teaching Mentors who assisted the Associate Director by running project groups, providing feedback and guidance to students, and helping with general program coordination. 66 students participated this year, a significant increase over last year's 51.

Our primary goals for the coming year are to

- Accommodate another large cohort while maintaining the same level of mentorship and a format that allows for productive discussions.
- Revise the curriculum to reflect Northwestern's participation in the Center for the Integration of Research, Teaching, and Learning (CIRTL) Network by developing a STEM focused "track" within the program.
- Explore models for accommodating increased enrollments.

Graduate Teaching Fellows Program

The Graduate Teaching Fellows (GTFs) are a cadre of graduate students with a demonstrated commitment to teaching excellence who wish to further develop their teaching and professional skills, and contribute to the pedagogical development of their fellow graduate students. Appointed for a full academic year, GTFs work with the Searle Center to produce programming and resources to improve teaching by graduate students at Northwestern. Selected in the spring via a competitive application process, the Fellowship comes with a stipend of $3000, funded by The Graduate School.

This was the second year for the program. Among other activities, the GTFs developed workshops for the New TA Conference and the Graduate Workshop Series; conducted teaching observations to provide feedback to graduate students on their teaching; and developed discipline-specific projects aimed at providing mentorship and improving the teaching of graduate students in their home departments.

nuViBE NU Bioscientist Mentoring Program

A series of mentoring workshops were offered to 15 NU Bioscientist mentors. Participants were graduate students and postdoctoral fellows in the biological sciences. Workshops were based on case studies, activities, and group discussions, focusing on mentoring expectations and communication, undergraduate summer research projects,

elements of good mentoring, identifying and resolving challenges, and mentoring philosophy. Participants were also asked to meet with their students in the winter quarter to develop a summer research project and reflect on the process. The average rating of workshops was 4.9/6.

Departmental Workshops and Other Interventions

In addition to our regular programs, we worked with interested departments and programs to provide workshops aimed specifically at their particular interests. These included a session on how to develop teaching practices as a graduate student for the School of Music, a workshop on developing a statement of teaching philosophy for the Sociology Department, and a session on course design held in one of the graduate student residential halls. We also provided individual consultations to numerous graduate students and post-docs on issues such as classroom management for TAs and course design. In partnership with faculty from McCormick, we also participated in numerous meetings and conferences related to producing a proposal for a substantial NSF grant to fund the Center for the Integration of Research, Teaching, and Learning (CIRTL) Network, which Northwestern recently joined as a member. Searle Center staff have also been active participants in the assessment team on this project.

PROGRAMS FOR UNDERGRADUATE STUDENTS

STEM Programs

Gateway Science Workshop (GSW) program

The Gateway Science Workshop (GSW) is a peer-led program designed to promote performance and retention of students in introductory "gateway" course sequences in chemistry, biology, math, physics, and engineering. Students attend weekly sessions in groups of 5 to 7, in which they tackle challenging course-related problems, which are developed by course faculty. They are led by a student facilitator who has previously done well in the course.

Workshops are offered for Biology 210, Chemistry 101-102-103, Engineering Analysis, Math 220-224-230 and 212-213-214, and Physics 130 & 135. During 2010-2011, we had 1257 registrations, served 22 individual classes, and worked with 22 faculty members and 3 graduate students. (See Appendix for a breakdown of student registrations by discipline.)

In the past year, we have engaged in the following activities to enhance the GSW program:

- Working with Ted Stadnik, a postdoc in Mathematics who developed a GSW problem database for that department, we created an electronic database to catalogue all GSW worksheet problems in order to record all problems used over time. The database will enable faculty to search for problems by keyword and easily develop tailor-made worksheets.
- In order to gain a better understanding of weekly-meeting dynamics and best practices, we collected observational data on these meetings. The results were presented to senior facilitators and will be shared with faculty to help promote effective weekly meetings between facilitators and faculty.
- To gain a better understanding of the challenges worksheet problems pose in workshops, we collected discipline-specific information about worksheet issues from senior facilitators. These initial data will be used to guide focus groups created around the same topic.
- Senior facilitators continued to take a leadership role within the program. They participated in a self-evaluation and identified areas to develop throughout the year. Each senior facilitator also observed his or

her first-year facilitators and played an active role in the recruitment and interviewing of new facilitators.
- In an effort to increase the number of underrepresented minority (URM) students who participate in GSW workshops, the program participated in "meet and greet" events with students from EXCEL, BioEXCEL, SAW, Society of Black Engineers, Society of Women Engineers, the Society of Hispanic Professional Engineers and One Step Before (minority premedical society). Members of these organizations were given priority registration in GSW throughout the academic year.

Our key goals for the coming year are the following:
- Introduce the electronic database to GSW faculty so it can be used to source worksheet problems.
- Present observational data regarding weekly-meeting dynamics and best practices to faculty. This project will inform decisions to encourage consistency across disciplines or maintain discipline-specific distinctiveness.
- Conduct focus groups with facilitators and students to reveal worksheet problem challenges. Currently, a broad variety of worksheets exist within and across disciplines (depending on the nature of the course and the perspective of the instructor). This project seeks to help define what a "good" worksheet problem looks like, and provide guidelines for faculty.
- Promote student–faculty interaction, which is highly desirable to GSW facilitators. Since most of the current interaction is in weekly meetings and very task-oriented, the program seeks to incorporate some informal events to increase relationship building between faculty and students. An example of such event would be an end-of-quarter meal.
- Promote social interaction among facilitators. Since most of the current interaction between facilitators is academically focused, the program seeks to create a committee of facilitators to advise the program on social or other events to help promote a sense of community among facilitators.
- Create stronger bonds with faculty involved with GSW. Examples of topics that might bring faculty together with program staff include unveiling the new problem database, describing the results of the weekly meeting observational data, sharing evaluation results and a general exchange of ideas.
- Create new opportunities for leadership development among senior facilitators, and expand their responsibilities. An example of a new responsibility is greater quality control within weekly meetings.
- Continue to increase the number of URM students who participate in GSW workshops. The program hopes to find new opportunities to connect with underrepresented populations on campus and continue existing efforts to connect with students through academic/social groups.
- Promote diversity among facilitators. The program will seek strategic ways to recruit facilitators who represent an increasingly diverse campus.

Facilitator Training Program (SESP 291)

SESP 291 is a one-credit course taken over three academic quarters, offered through the School of Education and Social Policy. All first-year GSW facilitators are required to enroll. The course is designed to provide facilitators an opportunity to develop their knowledge, understanding, and practical skills in mentoring and in facilitating groups within the practical requirements of the GSW program. Course goals are to introduce facilitators to the literature on learning and teaching; to familiarize facilitators with pedagogical methods relevant to mentoring and small-group facilitation; to provide them with the opportunity to discuss, reflect on, and enrich their facilitation experience in a way that enhances their workshop practice; and to encourage them to establish a supportive community among their students and fellow facilitators.

SESP 291 students also engage in a group research project, investigating a genuine pedagogical problem related to GSW. At the end of the year, students present their projects and findings at a poster fair.

66 students enrolled in SESP 291 during 2010–2011.

Science Research Workshop (SRW) program

The Science Research Workshop (SRW) program is an apprenticeship-style program designed to encourage undergraduates to major in science by engaging them in authentic scientific research during their early years of study at Northwestern. The workshops are made up of two main sections: 1) a faculty-led "science café" and 2) a peer-led workshop. Science cafés consist of a 30-minute discussion in which academic faculty and industry scientists with extensive research experience relate motivating stories about science, conducting scientific research, and their experience as undergraduates, graduate students, and young professionals conducting research. The topics of the science café take students through the initial stages of the research process, from contacting a lab to learning how to write an undergraduate research proposal. The workshops are led by peer facilitators, or senior undergraduate students, who are active participants in research labs, received training on facilitation skills and have successful proposal writing experience. The workshops are focused on developing an independent research project and writing a research proposal. By the end of the program all participants are expected to have confirmed a lab placement for the summer, and submitted a proposal for independent summer funding to either a University-based funder, such as the Undergraduate Research Grants Committee or the Weinberg College of Arts and Sciences, or an outside funder, such as the NSF Research Experience for Undergraduate grants.

In 2011–2012, 15 students completed the SRW program. Thirteen of these students submitted Undergraduate Research Grants (URGs), among which 9 won URGs, 1 won WCAS summer grant, and 1 won a MRSEC summer research grant. One of the 2 students who did not submit URG won the Radulovacki Global Health Fellowship.

Goals for the fifth year of the SRW program include the following:
Successfully sustaining what works in the current model, including 1) sustaining the program when similar competitive programs are run in parallel (e.g. the NUBioscientist program); 2) recruiting more students from existing disciplines; 3) helping all interested students secure a lab by the end of the fall quarter; 4) continuing the faculty feedback session near the end of the program (prior to URG submission) so students can get substantive feedback on their proposals; and 5) further improving our success rate winning funding from the URG committee and other University funders.

Challenges to address for the next year include the following:
As the SRW program is no longer funded by the original NSF grant, securing permanent funding to sustain the program is critical. This includes both support for program operation and support for summer research for those students who do not win URG. In addition, SRW should 1) continue to work with guest speakers to further refine the focus of their talks and align the talk to the proposal development process; 2) provide more rigorous training on how to mentor junior students on proposal writing; 3) keep closer contact and monitoring of students during summer research period.

NU Bioscientist

NU Bioscientist is a program for 30 incoming freshmen who are excited about doing independent research in the biological/biomedical sciences. NU Bioscientist students will take two specially designed courses their first year to provide background and preparation for doing research, and identify a laboratory and mentor for independent study during the summer following the first year.

Key accomplishments for 2011–2012:
Two freshmen seminars especially designed to help Bioscientist students build a solid foundation for a research career were developed and successfully implemented:

- The fall quarter freshman seminar "Biological Thought and Action" was designed to be introduce students to inquiry-based science, place biological research in a societal context, teach the basic tenets of scientific reasoning, and communicate the nature of scientific discovery. In this course, students were engaged in the

study of major scientific discoveries and the related social and historical impact of biological research.
- The winter quarter freshmen seminar "Science Research Preparation" was designed to help students enter independent research in Northwestern laboratories. It helped students develop an independent research project, write a research proposal, and deliver an oral presentation about their research. It also contains a lab portion that provides training on basic laboratory skills. Students in the program were matched with a PhD student or postdoctoral fellow who served as a mentor.

28 students (13 male, 15 female) completed the program, and all of them were accepted by a lab in which they will conduct authentic research.

BioEXCEL

Part of the NuVIBE initiative in the Biological Sciences, the BioEXCEL program was established to prepare incoming freshmen from underrepresented groups to succeed and become champions of diversity at Northwestern, with a longer-term goal of improving science retention rates and placement in post-graduate programs for students from underrepresented groups. Searle has co-sponsored the program since its inception in summer 2011, and now hosts the program. BioEXCEL immerses students in the rigors of chemistry and calculus at a college level. Students also take a leadership course, in which they develop team-building and decision-making skills as they create novel research proposals using principles of synthetic biology, and a course called Biological Research Highlights, which encompasses Q&As, case studies, role plays, and writing assignments.

This summer brings a diverse group of 19 students (8 men, 11 women) coming from different cultural and ethnic backgrounds, socioeconomic circumstances, religious beliefs, and geographical locations, and including our first international student.

Goals for upcoming year include the following:
- Streamline the process of lab placement (e.g. provide more hands-on support to the students, help establish the channel of communication between students and lab PIs).
- Improve the timeliness and clarity of communications of program requirements and expectations to all parties (students, lab PIs, lab mentors, program staff).
- Provide more frequent and prompt feedback to students on their performance in the freshmen seminars.
- Establish a monitoring mechanism to track student progress and lab-mentor contribution throughout the year.

NEW: Gateway Program in Biology Labs

The Searle Center is working in collaboration with the WCAS Program in Biological Sciences (PBS) to revamp the GSW program in line with the goals of the HHMI grant awarded to the University. In keeping with the goals of the grant to promote active learning in introductory biology courses, the GSW format will move to lab courses beginning in 2012–2013. Undergraduate peer leaders will be trained to guide small groups of their peers through lab sessions designed to engage students in active, conceptual thinking, rather than taking a more traditional "cookbook" approach to lab work. These small-group discussions will focus on the process of science, including structuring testable hypotheses, designing controlled experiments, analyzing data, and drawing conclusions from them. The Searle Center will continue to work closely with PBS faculty over the coming year to ensure that the program gets off the ground successfully and meets the goals of the larger initiative.

Academic Mentoring Program (AMP)

In collaboration with the University Academic Advising Center, the Searle Center piloted a small-group tutoring program, known as the Academic Mentoring Program (AMP), in 2011–2012.

The AMP program provides academic support for undergraduates enrolled in introductory courses known to be difficult for many students. Mentors – fellow undergraduates who have taken and done well in the course – meet weekly with a group of students to discuss and work through questions and problems the students have about their coursework. Mentors participate in training and regular meetings with AMP staff, and provide regular feedback to faculty about their groups' progress. Students are required to commit for the full quarter, so that the groups have an opportunity to build a sense of community, and so that the students and mentor become comfortable with one another. The groups meet at a set time and location each week for one hour. Students are expected to attend all sessions and prepare for each session in advance.

In 2011–2012, AMP ran in Macroeconomics (Econ 201), Introduction to Statistics for the Social Sciences (Stat 210), and Introduction to Psychology (Psy 110), with 153 student registrations and 12 student mentors participating.

Goals for next year include

- Expanding the program to additional courses (e.g., Econ 202–microeconomics).
- Continuing to review evaluation data and make program adjustments as appropriate.
- Developing plans for possible partner programs to serve underprepared students.

The Searle Center also runs the evaluation for AMP; please see the Research & Evaluation section for details.

Student-Organized Seminars (SOS) Leader Training Program

In 2011–2012, the Searle Center ran its second year of training for undergraduates who lead student-organized seminars (SOSs). These seminars are student-created, student-led, credit-bearing courses, sponsored by a faculty member in the relevant department, and offered through the School of Communication, the School of Education and Social Policy, and the Weinberg College of Arts and Sciences. Undergraduate SOS leaders gain depth of knowledge of their seminar topic, as well as valuable leadership, organizational, and mentoring experience.

The Searle Center training program focuses on developing leaders' understanding of teaching and learning concepts, ability to effectively facilitate learning for individuals and groups, and skill in using reflection and feedback for continuous improvement.

Eleven undergraduate leaders took part in the program during 2011–2012.

Goals for next year include

- Working with the schools to calibrate, where necessary, the expectations for SOSs.
- Developing a guidebook for student leaders.
- Developing guidelines for faculty working with SOSs.
- Bringing former leaders into the training program as mentors for current leaders.

Undergraduate Teaching and Learning Committee

The Searle Center launched its Undergraduate Teaching and Learning Committee in spring 2011. Composed of undergraduates from a variety of Northwestern schools, majors, and academic years, the Committee exists to

- give undergraduates an informed voice in the larger teaching and learning discussion at Northwestern
- provide responsible undergraduate feedback to faculty and graduate students about teaching
- create a dialogue among undergraduates about teaching and learning
- include an undergraduate perspective in Searle Center programs
- develop undergraduate-driven teaching-and-learning resources to benefit the University community
- help create a University culture in which undergraduates are both learners and facilitators of learning

During 2011–2012, the Committee had 7 student members, working in two project groups. One group focused on investigating possible enhancements to the CTEC, and worked in collaboration with the CTEC office to develop surveys for faculty and students, with the goal of learning how CTECs are perceived and used by different audiences. The other group focused on identifying excellent teaching practices, and has developed a survey to gather student testimonials about excellent teachers. These groups will continue their projects during the next academic year.

Goals for 2012–2012 include

- Create a stronger sense of belongingness: Increase communication among members, increase number of meetings.
- Incorporate presentations into subgroup activities, to foster motivation and sense of ownership.
- Introduce subgroup coordinators to improve communication within subgroups and to larger group.
- Provide more structure to help groups develop project ideas.
- Create a re-appointment process.
- Modify application to ask for students' expectations of the group.

SERVICES

The Searle Center has continued to develop the teaching and learning services it provides for faculty and graduate-student instructors across the University.

SERVICES FOR FACULTY & INSTRUCTORS

Small Group Analysis (SGA)

During a Small group analysis, Center staff and trained graduate-student Teaching Consultants (TCs) conduct a structured focus group with students in a class, and provide instructors with detailed and candid feedback during a follow-up meeting. In 2011-2012, we conducted 71 SGAs for faculty and graduate instructors.

Structured Observations

In structured observations, Center staff and Graduate Teaching Fellows observe an instructor's teaching, taking detailed notes about key areas, including student engagement, critical thinking, and effectiveness of teaching approaches. Includes follow up consultation; sometimes combined with SGA. We conducted 21 structured observations for faculty and 14 for graduate students during AY2011-12.

Individual Consultations

The Center provides individual consultations to faculty and other instructors at the University. These are often carried out in conjunction with either an SGA or structured observation, or in response to end-of-term course evaluations. They can also be stand-alone or ongoing meetings to engage in a variety of teaching, curriculum planning, and grantwriting activities, for individuals or in campus units.

Searle Center senior staff worked individually with approximately 115 faculty members this year, consulting on issues of teaching, assessment, and grantwriting. These included individuals from Feinberg, SESP, Music, McCormick, Medill, Communication, SCS, Kellogg, WCAS, and NU-Q.

Innovative Grants for Teaching

The grants are designed to support faculty, staff, post-docs and graduate students who wish to experiment with new ways to help students learn. The Searle Center awarded two grants this year: (1) Gary Fine, Director of Graduate Studies, Department of Sociology, to supplement his research on how graduate students read; and (2) Tom Mason, Professor of Materials Science and Engineering, to examine how personal engagement with scientists/engineers and the science/engineering they do will improve undergraduate non-major student attitudes toward and understanding of the scientific method/engineering design method and associated research processes.

SERVICES TO THE UNIVERSITY AND BROADER COMMUNITY

Library

The Center continues to add to its holdings (books, articles, journals, and DVD/videos), providing faculty/staff and graduate students with easy access to the rich literature on teaching and learning (northwestern.edu/searle/services_and_resources/center_library.html.) We have continued to donate materials to the University Archives (including video recordings of University Teaching Series events, foundational materials, professional correspondence, etc.), so that they may be archived properly. In addition, we will be adding substantial new technologies to the library (cameras, interactive white board, and other specialized equipment) which will enhance our ability to communicate with our stakeholders and collaborators and to model effective integration of teaching and technology.

Twitter Account

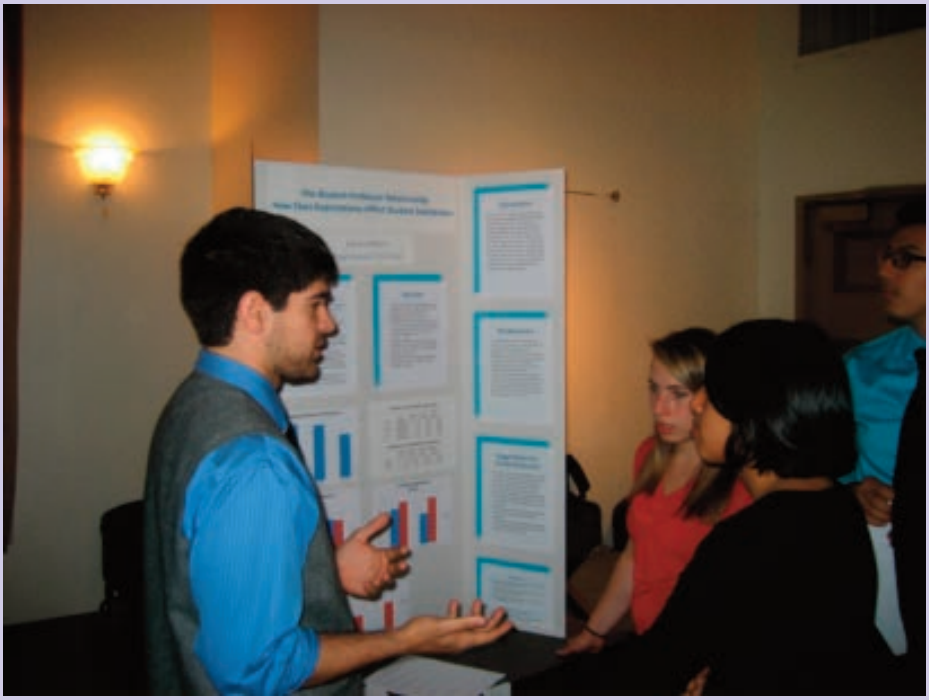
The Center's twitter account (@searleteaching) promotes Center programs and events, disseminates news about our work, and links to compelling articles on teaching and learning in the media and scholarly publications. The Center tweets an average of 3-4 times a week and has garnered 438 followers. The account was included in 32 Twitter lists. The Twitter account can be found at twitter.com/searleteaching.

Website

We have continued to update the website and to enhance the "Teaching and Learning Links" page to replace and update broken links. From July 2011 to July 2012, we had 22,1672 visits to the website, with 6,738 unique visitors, from 116 countries/territories.

RESEARCH AND EVALUATION PROJECTS

The Center is involved in a variety of research and evaluation projects on teaching and learning in higher and professional education. While some of the projects are undertaken independently by the Searle Center, the majority involve collaborations with faculty, often across multiple departments. Activities in this area include conducting research studies, evaluating programs and assisting faculty with writing of the pedagogical components of grant proposals to funders such as the National Science Foundation (NSF), the Howard Hughes Medical Institute (HHMI) and the National Institutes of Health (NIH).



ONGOING PROJECTS

Ongoing Research Projects in Undergraduate Education

Academic Mentor Program (AMP) Evaluation: AMP is a small-group, peer-led tutoring program which was piloted in 2011-12 in Economics, Statistics, and Psychology, developed jointly by Searle and the University Academic Advising Center. We evaluated the program throughout the academic year, using a waitlisted control group, and examining grades as well as student motivation and approaches to the coursework, as well as student and mentor satisfaction. Results suggested a positive impact of the Program. Findings were presented to the Undergraduate Council and used to make mid-course changes in program policies and practices in order to continue improving quality. Evaluation will continue in the second year of the Program's pilot funding.

Engineering Workshop Program (EWP): Completed its ninth year. McCormick School of Engineering continues to fund this extension of the GSW program and its evaluation in engineering. Evaluation continues to focus on performance and retention. An analysis of pooled data was also conducted for EWP. As with GSW, positive effects of the program were seen.

Engineering Undergraduate Student Experience Project: In spring 2012, we collaborated with a McCormick faculty member to investigate undergraduates' experience in their academic programs, with a focus on gender differences in the relationships among motivation, satisfaction, academic fit, and commitment to the discipline. Data have been collected and analysis is ongoing.

Gateway Science Workshop (GSW) Program Impact: This project, investigating the impact of a small-group learning program on performance and retention of undergraduates in STEM disciplines, commenced in 2001 and was originally funded by a 6-year grant from the Andrew W. Mellon Foundation. The program and program evaluation continues through funding from Northwestern and analysis of data on course grades and retention continues. We have continued to build a database, now pooling data from more than 10 years. These pooled analyses revealed an overall positive impact of the program on course grades and retention, with larger retention effect sizes seen for minority students and women in several courses. A paper presenting these 10-year results is in submission. We will also publish a book drawing on the GSW experience next spring, with Harvard Press.

Howard Hughes Medical Institute (HHMI) Grant: (Howard Hughes Medical Institute grant SP0008821 $2,000,000 over 4 years.) This project is a collaboration between the Howard Hughes Medical Institute and Northwestern University to undertake a major reform of its undergraduate biological science training program by emphasizing inquiry-based learning and by introducing students early on to the compelling realities of laboratory investigation, providing a research-informed context for scientific learning from the first months of matriculation through graduation.

The evaluation plan for this program has been finalized and baseline data are now being collected on course grades, course retention, performance on several standardized biology concept inventories, student interest in biology and science and student experience of the new Biology 215–218 course sequence. Data on experience of faculty, teaching fellows and graduate research mentors in the program are also being gathered.

Mellon-Mays Undergraduate Fellowship Program Evaluation: The Searle Center is managing the evaluation of this program, for which Northwestern was awarded $500,000 over 5 years. The program aims to increase the number of minority students who pursue PhDs in the humanities and social sciences. The goals of this primarily

qualitative evaluation are to better understand students' experiences in the program, including their development as academic researchers, their relationships with faculty mentors, and their general satisfaction with the program structure and policies. We have provided findings from the first year of the evaluation to Program directors; recommendations based on these findings have contributed to continued improvement of the Program. Evaluation is ongoing and will continue next year, as the Program has received a renewal of funding.

Science Research Workshop (SRW) program: The Science Research Workshop (SRW) program is an apprenticeship-style program designed to encourage undergraduates to major in science by engaging them in authentic scientific research during their early years of study at Northwestern. In 2011–2012, 15 students completed the SRW program. Thirteen of these students submitted Undergraduate Research Grants (URGs), among which 9 won URGs, 1 won WCAS summer grant, and 1 won a MRSEC summer research grant. One of the 2 students who did not submit URG won the Radulovacki Global Health Fellowship.

Student surveys revealed high levels of satisfaction among participants (averaging 3.6/4), and students' written comments suggested they learned how to write a research proposal, how to be a researcher in a real lab, and how to navigate the research process through the SRW experience, which is exemplified in the comment below:

"Thank you for a wonderful quarter of SRW! I learned so much from participating, and I think it was one of the best decisions I made at Northwestern. I do not know where I would have obtained such valuable research proposal writing skills and skills to succeed in a laboratory if it had not been for SRW...." (Biology participant)

Student Conceptions of Chromosome Segregation: Professor Robert Holmgren from the Biology department and Su Swarat and Stanley Lo from the Searle Center have collaborated on this project to explore how students conceptualize "chromosome segregation", an important yet difficult concept in genetics. They are particularly interested in identifying learning obstacles, and the possibility of using this knowledge to inform the design of instructional interventions.

Eleven students participated in this study from 2 different years. The method of clinical interview was employed, in which students were asked to solve problems on chromosome segregation and verbalize their thinking process. Detailed data analysis is currently underway. Preliminary findings suggest 2 major conceptual disconnections: 1) Students had difficulty integrating the two main modes of representation of chromosome segregation commonly used in instruction, i.e. the graphic representation of chromosomes and the symbolic representation of genes; 2) Students struggled to connect the problem-solving processes with conceptual or even content learning, such that they focused only on surface-level procedural features instead of the underlying principles of genetics. We also identified conceptual gaps in students' understanding of the process of chromosome segregation, which are potentially manifestations of the aforementioned disconnections. These gaps include: failure to integrate the processes of DNA replication into the meiosis, confusion about the division processes in meiosis I and II, and limited understanding of important, advanced concepts such as interference in recombination and chromosome rearrangements.

Student Conceptions of International Experience (SCIE): To better understand students' international experience through study abroad, the Buffett Center for International and Comparative Studies and the Searle Center for Teaching Excellence launched a collaborative project in the summer of 2007 called the Student Conceptions of International Experience (SCIE). Based on results of a phenomenographic study of undergraduate students' conceptions of international experience, a 70 item survey instrument to assess students' conceptions of and approaches to international experience was developed. The survey was piloted in June 2010 and a new 45-item survey has been developed in response to the results of the pilot study. Pilot data for the new survey will be collected over the summer of 2012.

Ongoing Research Projects in Faculty/Instructor Development & Learning

Enhancing Critical Thinking in STEM Disciplines: A Faculty Development Model: (NSF: Course, Curriculum and Laboratory Improvement (CCLI) award $227,000 over 3 years). This project is a collaboration between the Searle Center and the City Colleges of Chicago (CCC) to design, pilot and study a Science, Technology, Engineering, and Mathematics (STEM) faculty development program focused on improving higher order learning outcomes of STEM students. Nineteen faculty – 10 faculty from CCC and 9 from Northwestern are participating in the project and are aiming to improve the critical thinking of students in one undergraduate STEM class that they teach. The Critical Thinking Assessment Test (CAT) was administered to students at the beginning and end of the quarter/semester to measure the gains that students typically make in critical thinking. Gains in critical thinking were also assessed using course specific questions developed by faculty. Faculty reviewed the CAT data and the data from their own assessments at workshops in May and June. They are developing new activities to enhance critical thinking over the summer and will implement them in their class in the new academic year to see if they result in larger gains on the CAT test and course specific measures of critical thinking.

Palestinian Faculty Development Program: (USAID/AMIDEAST/Open Society; $200,000 over 2 years). The Center has partnered with An-Najah University in Nablus in the West Bank over the past 2 years as part of a program to increase the use of student-centered teaching at An-Najah University and in Universities in the West Bank more broadly. An-Najah University has established a Center for Excellence in Learning and Teaching (CELT) and is using a train-the-trainer approach to develop a cadre of faculty who will deliver workshops on teaching and learning to An-Najah faculty. In October, 2011 three teaching fellows from the An-Najah CELT took part in a study visit to the Searle Center to further develop their knowledge and expertise in the area of teaching and learning and faculty development. In February, 2012, Denise Drane and Greg Light and the An-Najah Celt Director and the An-Najah Director for Quality Assurance facilitated a workshop for deans on developing a strategic plan for teaching and learning. Staff from CELT and the Searle Center co-presented research papers on the project at the National Conference on Learning and Teaching in Higher Education for Palestine and at the following international conferences; Professional and Organizational Development (POD) and International Society for the Scholarship of Learning and Teaching (ISSOTL) and the Cyprus International Conference on Education Research and Conference.

Searle Fellows: Research over the past 8 years has focused on participants' conceptions of teaching, learning, research and mentoring and on how faculty understand relevance in their teaching. A new research agenda for this program is currently being formulated.

Ongoing Research Projects in Graduate Education

National Institutes of Health: Mentoring for Success: Developing Fundamental Skills for Biomedical Research: This program aims to increase the number of students from underrepresented backgrounds who are admitted to and retained in doctoral programs in the biological and life sciences at Northwestern. The Center continues to play an important role in both program design and evaluation. Our evaluation results suggest that the program has been extremely successful with substantial increases recorded in the number of underrepresented students admitted to doctoral programs in the biological and life sciences and very high retention rates of CLIMB (Collaborative Learning and Integrated Mentoring in the Biosciences) students. The program was originally funded by NIH for 5 years and a 3 year renewal was awarded in 2011.

National Institutes of Health: T32 Training Grants: The Center is currently involved in evaluation of doctoral training grant programs in the Cellular and Molecular Basis of Disease (CMBD), Biophysics, Biotechnology, Endocrinology and Mechanisms of Aging and Dementia (MAD). In addition the Center designed evaluation plans

and developed survey instruments for new proposals and proposals for renewal for training programs in Chemistry, Cellular and Molecular Basis of Disease, Magnetic Resonance Imaging, Reproductive Medicine and two Neuroscience training programs.

Focus Groups: Department of Physical Therapy (FSM). The Searle Center conducted two focus groups in February for the Department of Physical Therapy to acquire feedback from internship supervisors about the academic preparation and clinical performance of the DPT students from NU for ongoing program assessment. The first focus group had 10 participants and the second had 8 participants. We collated the focus group responses and offered initial suggestions for the program based on the supervisor feedback.

New Grant-Funded Projects

Extension of GSW Social-Comparison Concern Study: We applied for and were rewarded a $3500 grant from The Alumnae of Northwestern University to extend an experimental study we ran in 2010-11, in which modifications were made to the GSW program in an effort to help reduce student concern over being negatively compared with others in the groups. Results of the preliminary study were encouraging, with a paper currently in submission; the extension study will begin in fall 2012.

Student Experience in and Perception of Biology Laboratory Experiences: This project was funded by the Hewlett Fund at Northwestern University for $5189.04 from spring 2012 to summer 2013 and is led by Su Swarat and Stanley Lo from the Searle Center. The goal of this project is to identify and compare characteristics of different forms of laboratory experience (traditional, inquiry-based, and independent research) in the biological sciences and to understand how these experiences affect student learning. Specific areas of interest are: 1) sense of community, 2) help-seeking strategies, 3) ability to cope with challenges in scientific inquiry, 4) sense of personal achievement, 5) perception of connections between scientific inquiry and societal issues, and 6) understanding of scientific inquiry. This information is intended to better inform how to design scientific inquiry programs and laboratory experiences that engage students in meaningful learning activities. While the project is focused on the experience of students in the biological sciences, the outcomes should be applicable to other related STEM disciplines that rely on scientific inquiry and have laboratory courses.

Grant Writing Assistance

The Center has assisted faculty with the preparation of proposals to external funders over the last year. These include NSF Early Career Grants, NSF IGERT and NIH T32 and T90 proposals. To enhance the grant writing capacity of Northwestern faculty, the Center continues to offer yearly workshops on how to write the pedagogical and evaluation sections of grants.

DISSEMINATION

ACADEMIC PUBLICATIONS & PRESENTATIONS

Publications

In Submission

Calkins, S. & Light, G. Conceptions of Mentoring in Formalized Faculty Relationships. *International Journal for Academic Development.*

Drane, D., Micari, M., & Light, G. Students as Teachers: Effectiveness of a Peer-Led STEM Learning Program over 10 Years. *Journal of Science Education and Technology.*

Micari, M. Worrying about What Others Think: A social comparison–concern intervention in small learning groups.

In Press

Calkins, S., Johnson, N., & Light, G. (In press.) Changing Conceptions of Teaching in Medical Faculty. *Medical Teacher.*

Cook, R. & Calkins, S. (In press.) More than recall and opinion: Using clickers to promote complex thinking. *Journal of Excellence in College Teaching.*

Light, G., & Micari, M. (In press). *Making Scientists: Six Principles for Effective College Teaching*. Harvard University Press.

Pazos, P., Chung, J., & Micari, M. (In press.) Instant messaging as a task-support tool in information technology organizations. *Journal of Business Communication.*

Hirsch, P.L., Dugan, S.W., Drane, D., Swarat, S., Park, E.J., & Chang, R.P.H. (In press). Adding nanoscience education to first-year engineering design courses to enrich student experience. *Journal of Materials Educatio*n.

Publications 2012

Micari, M., & Pazos, P. (2012). Connecting to the professor: Impact of the student-faculty relationship in a highly challenging course. *College Teaching, 60*(2), 41–47.

Streitwieser, B., Le, E., & Rust, V. (2012). Research on study abroad, mobility, and student exchange in comparative education scholarship. *Research in Comparative & International Education, 7*(1), 5-19. Link to publisher website.

Swarat, S., Ortony, A., & Revelle, W. (2012). Activity matters: Understanding student interest in school science. *Journal of Research in Science Teaching, 49*(4), 515-537.

Publications 2011

Calkins, S., & Seidler A. (2011). Faculty perceptions of relevance in teaching and learning. *International Journal of Teaching and Learning in Higher Education, 23*(2), 215-225.

Case, J. & Light, G. (2011). Emerging methodologies in engineering education research. *Journal of Engineering Education, 100*(1),186-210.

Micari, M., & Drane, D. (2011). Intimidation in small learning groups: The roles of social-comparison concern, comfort, and individual characteristics in student academic outcomes. *Active Learning in Higher Education, 12,* 175–187.

Streitwieser, B., & Light, G. (2011). When undergraduates teach undergraduates: Conceptions of and approaches to teaching in a peer-led team learning intervention in the STEM disciplines: Results of a two year study. *International Journal of Teaching and Learning in Higher Education, 22*(3), 346-356.

Swarat, S., Light, G., Park, E-J., & Drane, D. (2011). A typology of undergraduate students' conceptions of size and scale: Identifying and characterizing conceptual variation. Journal of Research in Science Teaching.

Swarat, S., Light, G., Park, E.J., & Drane, D. (2011). A variation theory approach to develop learning progressions for engineering concepts. Proceedings of the Research in Engineering Education Symposium, Madrid, Spain.

Swarat, S., Drane, D., & Light, G. (2011). Improving student understanding of "size and scale" through a variation theory approach. Proceedings of the National Association for Research in Science Teaching Annual Conference, Orlando, Fl.

Talks & Paper Presentations

Presentations 2012

Alawi, N., Drane, D., Hilal, H. (June, 2012). Intervention Types and Strategies in Formative Evaluation:CELT Activities as a Case Study. National Conference on Excellence in Learning and Teaching in Higher Education, Ramallah, West Bank.

Bode, M., Drane, D., & Northrup, F. (2012, May). What contribution do mathematical skills make to student success in introductory chemistry classes? Presentation at Chicago Symposium Series: Excellence in Teaching Mathematics and Science: Research and Practice, Chicago, IL.

Calkins, S. (2012, August). "The Importance of Critical Thinking"; "Enhancing Learning through Critical Thinking;" "Building and Assessing Critical Thinking Capacity in Our Students." Invited keynote address and workshops. Fall Convocation: University of Texas, Brownsville.

Calkins, S. (2012, May). Enhancing Critical Thinking in Law Students. Keynote Address for Canadian Association of Law Teachers Annual Conference. Montreal, Quebec, Canada.

Calkins, S., Drane, D., & Light, G. (2012, May). Enhancing Critical Thinking Workshop. City Colleges of Chicago. Malcolm X College, Chicago.

Lee, S., Drane, D., Light, G., & McGee, R. (2012, May). Helping diverse communities of graduate students improve their metacognitive skills to discover and develop their unique strengths. Presented at the Conference on Understanding Interventions that Broaden Participation in Research Careers, Baltimore.

Light, G., Drane, D. (2012, February) Strategic planning for teaching and learning. Workshop presented at An-Najah National University, Nablus, West Bank.Mohammad, A.K.T., Drane, D., & Light, G. (2012, February). Needs assessment and beyond in the setup of centers for teaching and learning excellence: An-Najah University center as a case study. Cyprus International Conference on Educational Research. Middle East Technical University, North Cyprus.

Lo, S., & Micari, M. (2012, March). A Discipline-Based, Year-Long Faculty Development Program Focused on the Revision of Introductory Biology Courses. Presentation at Chicago Symposium Series: Excellence in Teaching Mathematics and Science: Research and Practice. Evanston, IL.

Micari, M. (2012, March). Infusing Critical Thinking into the Biology Curriculum. Presentation to Health Sciences faculty, Oakton Community College, Des Plaines, IL.

Stein, B., Haynes, A., & Drane, D. (2012, April). Getting Faculty Involved in Assessing and Improving Students' Critical Thinking. Presentation at North Central Association Higher Learning Commission Annual Conference, Chicago, IL.

Swarat, S,. Lo, S.M., & Light, G. (2012, July). Conceptions toward understanding chromosome segregation. Society for the Advancement of Biology Education Research.

Presentations 2011 (August–December)

Calkins, S. (2011, October). Getting beyond the obvious: Faculty perceptions of relevance. Workshop presented at the Professional Organization Development Network (POD), Atlanta, GA.

Davis, N., & Calkins, S. (2011, October). Breaking the frame: a critical inquiry into teaching literature and film. Paper presented at ISSOTL Conference 2011, Milwaukee, WI.

Light, G. (2011, November). A framework for effective teaching in higher education: Innovation & challenge. Program on Innovative Teaching and Learning, the LASPAU Institute: Harvard University, Cambridge, MA

Light, G., Swarat, S., Park, E.J., & Drane, D. (2011, October). A variation theory approach to develop learning progressions for engineering concepts. Paper presented at the Research in Engineering Education Symposium, Madrid, Spain.

Micari, M. (2011, October). Worrying about what others think: Reducing social-comparison concern in a small-group peer-led environment. Paper presented at ISSOTL Conference 2011, Milwaukee, WI.

Pickard-Criswell, J., Shraim, K., Light, G., Mohammad, A., & Drane, D. (2011, October). Enhancing learning and teaching in the Middle East: A Palestinian- American collaboration. Paper presented at ISSOTL Conference 2011, Milwaukee, WI.

Shraim, K., Mohammad, A., Light, G. (2011, October). A cascading training model for academic excellence and innovation. Paper presented at ISSOTL Conference 2011, Milwaukee, WI.

UNIVERSITY CONTRIBUTIONS/OUTREACH

Committee Work

Inside Northwestern

- Assessment Council (and Assessment Subcommittee) – Susanna Calkins
- Classroom Committee (Teaching Methods/Technology Subcommittee Chair) – Susanna Calkins
- Contemporary Thought Speaker Series Committee - Greg Light
- CTEC Committee – Greg Light, Susanna Calkins (redesign subcommittee)
- Educational Technologies Advisory Committee – Greg Light
- Mellon Mays Undergraduate Fellowship review committee – Marina Micari
- Office of Fellowships, Fulbright faculty mentors and applications review committee – Susanna Calkins, Marina Micari
- NUSAC – Sara Woods
- Prosthetic Orthotic Center Education Program (NUPOC) Advisory Board – Susanna Calkins
- University Diversity Council – Greg Light (Co-Chair: Academics/Education Working Group)
- Undergraduate Research Assistant program Review Committee – Greg Light
- Undergraduate Thesis Advising (Urban Studies, WCAS) – Marina Micari
- Web Communications Committee – Sharon Bautista

Outside Northwestern

- Center for Biophotonics, Science & Technology (CBST), NSF Center, University of California, Davis – External Advisory Committee – Greg Light
- Committee on Institutional Cooperation (CIC) Teaching Center Directors group – Greg Light, Susanna Calkins
- NSF External Advisory Committee for KEYSTONE Project, KEYs to Success Through year ONE (Elmhurst College) – Denise Drane
- NSF Center for Biophotonics, Science & Technology (CBST): educational advisory board – Greg Light
- NSF National Advisory Board: Collaborative Research: Integrating Cognition and Measurement with Conceptual Knowledge: Establishing the validity and diagnostic Capacity of Concept Inventories – Greg Light
- NSF National Advisory Board: Critical Thinking Assessment (CAT) Tool – Greg Light

Teaching

- Susanna Calkins: MSHE 467– History and Philosophy of Higher Education (SESP)
- Susanna Calkins: HIST 201B – European Civilization II (SCS)
- Denise Drane: CSD 304 – Statistics in Communication Sciences and Disorders (SoC)
- Joe Lampert: POLI SCI 201-A – Introduction to Political Theory (SCS)
- Joe Lampert: POLI SCI 390-CN – Special Topics in Political Science: Democratic Theory (SCS)
- Stanley Lo: BiolSci 110-2 – Biochemistry and Molecular Biology (SCS)
- Greg Light: MSHE 405 – Learning and Teaching in Higher Education (SESP)
- Marina Micari: SESP 291 – Undergraduate Mentoring (SESP)*
- Marina Micari: MSLOC Capstone Advising (SESP)

**GSW Facilitator training course*

Reviewing

- *American Journal of Evaluation* – Marina Micari
- *Education Research Review* – Greg Light
- *Higher Education* – Greg Light

- *Higher Education Research & Development* – Greg Light
- *International Journal of Academic Development* – Greg Light
- *Journal of Engineering Education* – Greg Light
- *International Journal of Academic Development* – Susanna Calkins
- *International Journal of Science Education* – Greg Light, Marina Micari
- *International Journal of Teaching and Learning in Higher Education* – Susanna Calkins, Marina Micari
- *Journal of Engineering Education* – Denise Drane, Greg Light
- *Journal of Women and Minorities in Science and Education* – Marina Micari
- National Science Foundation Grant Review Panels – Denise Drane, Greg Light
- *Pediatrics* – Denise Drane

PROFESSIONAL DEVELOPMENT ACTIVITIES

Susanna Calkins: Northwestern University Best Practices Forum (March 2012)
Marina Micari: Evaluator's Institute - Utilization-Focused Evaluation (April 2012)
Marina Micari: Northwestern Leadership & Management Series (completed summer 21
Stanley Lo: CAT Assessment and Learning (train the trainer for the Critical thinking Assessment Test) (Nov 2011)
Stanley Lo: National Academies Summer Institute on Biology Education Follow-Up Meeting (Feb 2012)
Stanley Lo: NSF Grants Conference (grants workshop run by NSF) (March 2012)
Stanley Lo (facilitator): National Academies Summer Institute on Science and Engineering Education (July 2012)
Sara Woods: On-campus workshop - Learning Domains (Oct 2011)
Sara Woods: On-campus workshop - Designing Workshops and Progs that Promote Student Learning (Dec 2011)

All staff: Searle Center annual staff retreat - summer 2011

The Center also engages in yearly 360-degree review, so that staff members have the opportunity to hear feedback from diverse sources and enhance their work.

SEARLE CENTER STAFF 2010–2011

Principal Staff

Remi Akinyemi, Project Coordinator
Sara Armstrong, Graduate Assistant
*Sharon Bautista, Program Associate
Susanna Calkins, Associate Director
Denise Drane, Associate Director
*Joe Lampert, Associate Director
Greg Light, Director
Marina Micari, Associate Director
*Tim Morse, AMP Coordinator
Carrie Murphey, AMP Coordinator (temporary)
Jennifer Pickard-Criswell, Research/Program Coordinator
**Tom Popelka, Program Associate
Casey Prouty, GSW Coordinator (temporary)
Rachel Ricci, Graduate Assistant
Dreana Rubel, Center Manager
**Nancy Ruggeri, Associate Director
*Su Swarat, Sr. Research Associate
Shyanmei Wang, Program Associate
Sara Woods, Program Coordinator
**Resigned during 2011–2012*
***Joined during 2011–2012*

Work-Study Students

Ben Li
Hyerin Lee
Matthew Nabavian
Angela Salmons

Associates of the Center

Luke Flores - Senior Associate: BioExcel & NU BioScientist programs
Stanley Lo - Senior Associate: STEM projects
Bernhard Streitwieser - International Research Associate

Gateway Science Workshop Program Assistants

Shelly Mo
Marit Tweet

APPENDIX: PROGRAM DATA

FACULTY PROGRAMS DATA

Faculty Workshop Series

Date	Workshop Titles	Attendance	Average Rating
9/26/2011	Promoting Relevance in Your Teaching	7	Used alternative evaluation
10/18/2012	Setting Your Students Up to Succeed: Designing a Learner-Centered Course	9	4.67
11/7/2012	Connecting with the Crowd: Promoting Learning in the Large Lecture	16	4.8
11/17/2012	Using Clickers in med school setting	10	Used alternative evaluation
12/8/2012	Developing an Effective Pedagogical Component for Your Grant Proposal	9	4
1/26/2012	Connecting with the Crowd: Lecturing Effectively in Large Classes	14	3.86
2/15/2012	Grading with Intent: Designing Effective Assessments to Improve Student Learning	6	4.2
3/13/2012	Developing an Effective Pedagogical Component for Your Grant Proposal	9	4.22
4/12/2012	Building critical thinking capacity in your students	16	Used alternative evaluation
4/18/2012	Writing to Learn: Developing and Evaluating Writing Assignments within the Disciplines	7	4.67

Specialized Workshops and Sessions

School	Department	Session	Attendance
FSM	NUPOC	Course Design	18
FSM	NUPOC	Teaching Methods and Activities	8-10
FSM	NUPOC	Assessing Student Learning Outcomes	8-10
FSM	NUPOC	Evaluating Teaching	8-10
FSM	NUPOC	Designing a Syllabus	18
FSM	MPH	Promoting Effective Discussion	15
McCormick	Career Services	Effective Course Design	10
SCS	----	Enhancing Critical Thinking	35
WCAS	Math (Calculus)	Student Engagement & Assessment (2 sessions)	10
WCAS	Family Institute	Enhancing Learning through Critical Thinking	20

NuVIBE Faculty Workshops

Date	Workshop Title	Presenter
6/3/2011	Does Active Learning Work?	Stanley Lo
6/3/2011	Student Approaches to Learning	Gregory Light
6/3/2011	Designing a Learner-Centered Course	Joseph Lampert, Stanley Lo
6/3/2011	Active Learning Methods for the Biology Classroom	Stanley Lo, Marina Micari
7/11/2011	Scientific Teaching	Greg Beitel (Mol Biosciences), Stanley Lo
9/7/2011	Designing Effective Student Assessments	Stanley Lo, Marina Micari
9/23/2011	Process Oriented Guided Inquiry Learning (POGIL)	Richard Moog (Franklin & Marshall College)
10/14/2011	Stereotype Threat and Diversity in the Classroom	Joshua Aronson (New York University)

University Teaching Roundtables

Date	Title	Facilitator	Attendance
10/7/2011	The Art and Science of Lecturing: Maintaining Attention and Engagement in Large Classes	Renee Engeln-Maddox (Psychology)	12
1/31/2012	Portable Labs: Adding Labs to a Lecture Course	Michael Peshkin (Mech Eng)	18
2/23/2012	Faculty-Student Interactions Outside the Classroom: Can Office Hours be Magical?	Wesley Burghardt (Chemical and Biological Engineering)	11
4/26/2012	Adventures beyond the Classroom: Making Excursions a Meaningful Part of the Curriculum	Ingrid Zeller (German)	7
5/18/2012	Teaching Difficult Topics: Difference and Power	Dylan C. Penningroth (History) & Larry Stuelpnagel (Medill)	15

Searle Fellows Program Participants

Fellow Name	Department	Mentor
Danny Abrams	Engineering Sciences and Applied Math	Ed Olmstead
Oluwaseyi Balogun	Mechanical Engineering	Sridhar Krishnaswamy
Robert Greenberg	Pediatrics	Julie Kim Stamos
Nikos Hardavellas	Electrical Engineering and Computer Science	Gokhan Memik
Dana Hill	Law	Martha Kanter
Jiaxing Huang	Materials Science & Engineering	Tom Mason
Brent Huffman	Medill	David Abrahamson
Sarah Jacoby	Religious Studies	Ken Seeskin
Georgia Kernell	Political Science	James Farr

continued

Mary Nevin	Pediatric Pulmonary Medicine	Ramsay Fuleihan, MD
Jennifer Nicholas	Medical Imaging	Marianne M. Green
Wendy Pearlman	Political Science	Reuel Rogers
Jyothy Puthumana	Cardiology	Gary Martin
Emily Rohrbach	English	Jules Law
Carol Schmidt	Ophthalmology	Robert Kushner
Keith Tyo	Chemical and Biological Engineering	Wesley Burghardt

GRADUATE STUDENT PROGRAMS DATA

New TA Conference, 2011

Total Attendance: 305
Average Rating: 4.3 (on 5 point scale)
Participation by School:

Weinberg College of Arts and Sciences	66%
Bienen School of Music	1%
School of Communication	13%
Feinberg School of Medicine	.5%
Kellogg School of Management	.5%
McCormick School of Engineering	18%
School of Education and Social Policy	1%

2011–2012 Graduate Teaching Certificate Program Participation

Weinberg College of Arts and Sciences	47%
Bienen School of Music	1%
School of Communication	17%
Feinberg School of Medicine	12%
Kellogg School of Management	5%
McCormick School of Engineering	17%
School of Education and Social Policy	1%

2011–2012 Graduate Workshop Participation

Weinberg College of Arts and Sciences	42%
Bienen School of Music	1%
School of Communication	25%
Feinberg School of Medicine	12%
Kellogg School of Management	4%
McCormick School of Engineering	15%
School of Education and Social Policy	1%

Graduate Student Workshop Series

Date	Workshop Titles	Attendance	Average Rating (1–5)
9/26/2011	Promoting Relevance in Your Teaching	7	Used alternative evaluation
10/18/2012	Setting Your Students Up to Succeed: Designing a Learner-Centered Course	9	4.67
11/7/2012	Connecting with the Crowd: Promoting Learning in the Large Lecture	16	4.8
11/17/2012	Using Clickers in med school setting	10	Used alternative evaluation
12/8/2012	Developing an Effective Pedagogical Component for Your Grant Proposal	9	4
1/26/2012	Connecting with the Crowd: Lecturing Effectively in Large Classes	14	3.86
2/15/2012	Grading with Intent: Designing Effective Assessments to Improve Student Learning	6	4.2
3/13/2012	Developing an Effective Pedagogical Component for Your Grant Proposal	9	4.22
4/12/2012	Building critical thinking capacity in your students	16	Used alternative evaluation
4/18/2012	Writing to Learn: Developing and Evaluating Writing Assignments within the Disciplines	7	4.67

Graduate Teaching Consultants (TCs)

Sara Armstrong, Theatre and Drama
Megan Bernard, Communication Studies
Beth Corzo-Duchardt, Screen Cultures
Natalie Gruenke, Chemistry
Jennifer Hobbs, Physics
Heather Lucas, Psychology
Jennifer Myers, Music Studies
Taylor Page, Chemistry
Rachel Ricci, Political Science
Karthik Sekar, Chemical Engineering
Desiree Weber, Political Science

Graduate Teaching Mentors

Megan Bernard, Communication Studies
Jennifer Hobbs, Physics
Ericka Menchen-Trevino, Media, Technology, and Society
Catherine Reinke, Biology
Paul Thelen, Theatre and Drama
Kiki Zissimopoulos, Biomedical Engineering

TA Fellows Program 2011–2012 Participants

James Antony, NUIN
Koshonna Brown, Microbiology-Immunology
Angela Chang, Chemistry
Daphne Demetry, Sociology
Natalie Gruenke, Chemistry
Shoai Hattori, NUIN
Jennifer Hobbs, Physics
Kathryn Johnston, Rhetoric and Public Culture
Álvaro Parra, Economics
Karthik Sekar, Chemical Engineering
Desiree Weber, Political Science

Graduate Teaching Certificate Program 2011–2012 Participants

Laila Ballout, History
Sonia Bhangoo, NUIN
Aigerim Bizhanova, IGP
Emilie Boone, Art History
Alison Boyd, Art History
Allison Bradley, Biomedical Engineering
Fernando Carbajal, History
Benjamin Chiles, Communication Studies
Brian Clites, Religious Studies

Moshe Cohen, Civil Engineering
Jordana Cox, Theatre and Drama
Maureen Craig, Psychology
Daphne Demetry, Sociology
Kristen Dennis, IGP
Caroline Doty, IGP
Caitlin Duffy, Social Psychology
William Eimer, IGP
Anndrea Ellison, Rhetoric and Public Culture
Elissa Harbert, Musicology
Brian Harrison, Political Science
Julianne Hatfield, IGP
Elliot Heilman, Rhetoric and Public Culture
Justine Howe, Religious Studies
Chin Ming Hui, Social Psychology
Lynn Jencks, Religious Studies
Tingting Jiang, IEMS
Kathryn Johnston, Rhetoric and Public Culture
Brady Jones, Human Development and Social Policy
Priya Kamat, Psychology
Monica Kapoor, Materials Science and Engineering
Theresa Keeley, History
Lisa Kelly, Theatre and Drama
Robert Kennedy, Chemistry
Geraldine Kress, NUIN
One-Sun Lee, Chemistry
Yang Liu, Civil Engineering
Jenna Luque, Linguistics
Rebecca Marchiel, History
Nicholas Miller, Art History
Joseph Moser, Religious Studies
Jesse Nasta, History
Katherine Newbold, Screen Cultures
Stacy Ochoa, Molecular Biosciences/IBis
Taylor Page, Chemistry
Jinxiang Pei, IEMS
Jessica Philippi, Rhetoric and Public Culture
Vanessa Pouthier, Management and Organizations
Munjulika Rahman, Performance Studies
Aileen Robinson, Theatre and Drama
Micah Rogel, Biomedical Engineering
Allen Rosenthal, Clinical Psychology
Maureen Ryan, Screen Cultures
Shashank Shalgar, Physics and Astronomy
Matt Sonntag, Chemistry
Matilda Stubbs, Anthropology
Jennifer Sumner, Clinical Psychology
Matthew Tanzy, Engineering Sciences and Applied Mathematics

Anna Terwiel, Political Science
Joseph Tiano, Medicine, Division of Endocrinology
Jayaram Uparna, Management and Organizations
Jiunwen Wang, Management and Organizations
Henrik S Wilberg, German
Thea Wilson, Civil Engineering
Wei Xie, IEMS
Haley Yaple, Engineering Sciences and Applied Mathematics
Tyler Zimmer, Philosophy

Graduate Teaching Fellows 2011-2012 Participants

Winter (Jade) Werner, English
Daniel Visscher, Mathematics
Xaver Neumeyer, Mechanical Engineering
Elizabeth Lenaghan, Media, Techonology & Society
Beth Corzo-Duchardt, Screen Cultures
Connor Doak, Slavic Languages and Literatures
Tatiana Filimonova, Slavic Languages and Literatures
Kati Sweaney, Theater & Drama

UNDERGRADUATE PROGRAMS DATA

Gateway Science Workshop (GSW) Program

Discipline	Male	Female	Minority	Majority	Total
Biology	109	173	18	264	**282**
Chemistry	60	104	35	129	**164**
Organic Chemistry	104	204	25	313	**338**
Physics 130	26	64	12	78	**90**
Physics 135	67	58	17	108	**125**
EA	39	54	23	70	**93**
Math 212/13/14	0	6	1	5	**6**
Math 220	11	25	12	24	**36**
Math 224	15		11	27	**38**
Math 227	0	2	2	0	**2**
Math 230	31	52	16	67	**83**
Total	**462**	**742**	**172**	**1085**	**1257**

Note: data taken from SPSS file

SESP 291/GSW Facilitator Training Course Participants

Student Major	**# of Participants**
Biological Sciences	18
Engineering	17
Chemistry	5
Psychology	4
Secondary Teaching	4
Computer Science	3
Art Theory and Practice	2
Math Methods in Soc Sci	2
Philosophy	2
Anthropology	1
Economics	1
Human Development	1
Integrated Science Prog	1
Mathematics	1
Political Science	1
Radio/TV/Film	1
Voice and Opera	1
TOTAL	**65**

GSW Senior Facilitators

Wyatt Brothers
Eli Cadoff
Debra Chen
Andrew Choi
Nate Davidson
Sakif Ferdous
Avi Jayaraman
Jenny Kim
Shelly Mo
Devin Boe
Ellie Ryan
Gokila Pilliai
Justin Rondinelli
Marit Tweet
Mahima Vijay
Ben Yu
Margaret Yu

Science Research Workshop (SRW) Program Participants

	Female	Male	Total
Biology	4	7	11
Chem/ Mat Sci	0	4	4
Total	4	11	15

Academic Mentoring Program (AMP) Participants

Discipline	Male	Female	Missing data	Minority	Majority	Missing Data	Total
Econ 201	26	58		17	61	6	**84**
STAT 210	22	28	1	11	29	11	**51**
PSYCH	4	14		6	10	2	**18**
Total	**52**	**100**	**1**	**34**	**100**	**19**	**153**

Note: data taken from SPSS file

AMP Mentors

Caitlin Ahearn
Andy Bell
Alex Entz
Zach Flanzman
Abby Hawley
Joanna Jaros
Monica Kalwani
Kim Lourette
Chelsea Renter
Josh Rosen
Neil Sarkisian
Phil Trachtenberg

Undergraduate Teaching & Learning Committee Members

Lindsay Abbassian, Medill
Jennifer Bae, Weinberg
YoungSang (Allen) Lee, Weinberg
Dylan Mombach, School of Communication
Daniel Nissani, SESP
Birju Rao, Weinberg
Trenton Rogers, Weinberg
Selena Tenorio, School of Continuing Studies
Esther Wang, SESP