

Graduate Group in Science & Mathematics Education (SESAME)

Overview

The Graduate Group in Science and Mathematics Education (SESAME) at the University of California, Berkeley is an interdisciplinary academic unit dedicated to advancing the understanding and practice of learning and teaching in science, engineering, and mathematics. It acts in most respects like a regular department, carrying out research, teaching courses, and offering a graduate program leading to a Ph.D. degree in science or mathematics education. The faculty of the group consists of professors from several of the Berkeley science and engineering departments and the School of Education, and instructors associated with other units on campus such as the Lawrence Hall of Science. The group operates under the auspices of the Graduate Division.

SESAME is closely related to the EMST (Education in Math Science and Technology) program and shares many courses with EMST. A major difference in the programs is that SESAME students are expected to obtain at least master's-level competency in their mathematical or scientific disciplines. It produces scholars who can communicate well with scientists or engineers as well as with educational researchers and practitioners. The program includes studies that connect human development, cognitive science, and educational technology with the learning of science, mathematics, and engineering.

SESAME Ph.D.s have frequently taken positions in college science departments, teaching courses in the discipline but serving as the "education person" in the department and doing research on the teaching and learning of the subject matter. Through the years SESAME students have also focused on learning in informal settings and have gone on to careers in institutions such as museums and science centers.

Focus of Study

SESAME offers a graduate program leading to a doctoral degree in science, mathematics, or engineering education. The program is designed to produce graduates who have advanced expertise in a scientific discipline as well as in educational theory and research methodologies.

This Graduate Group was established so individuals with training or experience in a mathematical, scientific, or technical discipline could pursue advanced studies focused on educational issues in these disciplines. SESAME is an acronym for Studies in Engineering, Science and Mathematics Education. The Group was formed in 1968 by several Berkeley faculty members in science and mathematics departments. It is formally called the Graduate Group in Science and Mathematics Education, but the acronym is still used.

SESAME students work with the Group's faculty to gain a better understanding of learning, to design more effective teaching approaches, and to create experiences that enhance the scientific

and mathematical literacy of the general public. A major aim of the Group is to identify general theoretical principles that can guide the design of effective instruction.

Many of the students' projects are concerned with college-level teaching in their disciplines. Others are concerned with curriculum development for elementary and secondary schools, research into cognitive processes underlying good performance in scientific domains, investigations of principles for the design of computer-based educational software, or studies of informal learning in science museums and other places open to the public.

Discipline Specific Nature of the Ph.D.

Unlike a School of Education program, SESAME's faculty consists primarily of scientists, mathematicians, engineers, and computer scientists. SESAME students therefore can have closer contact with faculty in their disciplines than is typically available in education programs.

Many SESAME students have thesis advisors from their discipline. Most take graduate-level courses, serve as teaching assistants, and attend seminars and lectures in their fields. SESAME students often consult with faculty in their discipline while working on their doctoral research projects.

Admission to the Program

To enter the program, a student must have an excellent academic record with a bachelor's or, preferably, a master's degree in a natural science, mathematics, or engineering/computer science. Experience teaching, developing instructional materials, or doing educational or psychological research in these areas will also be favorably considered. Knowledge of psychology, cognitive science, education, or statistics is helpful but not required.

For a student to be admitted, a SESAME faculty member who is suitable for supervising the student's dissertation research must agree to sponsor the student's admission to the program. Although it is not required, it is helpful if the applicant can speak or meet with SESAME faculty members who share some interests with the applicant. In some cases if a specific discipline (e.g., chemistry, zoology) is not represented within SESAME, applicants may be asked to meet with faculty members in those departments.

Applicants must meet all the regular admission criteria of the Graduate Division of the University of California, Berkeley. This will require submitting transcripts, letters of recommendation, a statement of purpose and scores on the General Graduate Record Examination to the UCB Graduate Division and/or SESAME department. Typically applications for admission are due in January. Please check with the Graduate Division and the SESAME Program Assistant (642-4207) for more information on the admissions process.

Between 10 and 15 students are typically enrolled. Faculty in departments of mathematics, engineering, chemistry, computer science and education participate on a part-time basis. There is also a full-time SESAME Lecturer. Because of the breadth of its membership, the SESAME Group

has close ties with numerous academic units and programs as well as with the Lawrence Hall of Science.

Type of Program (PhD)

Students are expected to enroll full time and to complete their studies in 10 or 12 semesters (depending on whether they already has a master's degree).

While SESAME does emphasize research in the processes of learning and teaching; it is not a teacher training unit. This program does not prepare pre-college teachers (see various School of Education credential programs for teacher training programs). Those interested in careers in college-level math/science teaching (along with educational research), science museum program development, or research in the learning and teaching of science per se are likely to find a doctoral program like SESAME suitable. SESAME students who take jobs as faculty in schools of education-and even in college-level mathematics and science departments-frequently have teacher training responsibilities.

Research assistantships, teaching assistantships in science, mathematics, or computer science departments - and University Block Grants - provide financial support for most SESAME students.

The graduate program includes advanced courses in the student's discipline, science and mathematics education, and psychology; teaching experience; seminars dealing with research projects of faculty and fellow students; colloquia presented by outside speakers; and research into an educational problem connected with mathematics, science, engineering, or computer-science education.

Normative Time

"Normative time" is the number of years considered to constitute adequate time for completing different requirements for the Ph.D. degree under ordinary circumstances. In SESAME there are different normative times for students entering with a master's degree and those entering without a master's degree. Since students are expected to achieve a master's degree level of competency within a mathematical, scientific or technical field, those students entering without a master's degree are given one more year to reach normative time. This allows those students time to take the extra courses within their chosen discipline.

There are two normative times of importance to SESAME students. The first is the time it takes to be advanced to Candidacy. The second is the time it takes to complete all the requirements for the Ph.D. including the dissertation. These are important because they are key factors in the faculty's evaluation of whether a student is making adequate progress towards the degree. In addition, students who are advanced to Candidacy within the appropriate normative times may be eligible for the Dean's Normative Time Fellowship

<<http://www.grad.berkeley.edu/policies/dntf.shtml>> The current normative times are:

Milestone	Admitted with M.A	Admitted without M.A.
Advancement to Candidacy	7 semesters	8 semesters
Completion of all Ph.D. Requirements	10 semesters	12 semesters

You are discouraged from planning a dissertation project that will require more than the normative time to complete. Students who exceed normative time may be prevented from having a campus job or receiving financial support from campus resources .

THE FIRST YEAR

During the first year in the SESAME program, you will undertake studies among the following: general cognition, curriculum and instruction, qualitative methodology, quantitative methodology, and an action-oriented course within a discipline. (See "Required Course work" below.) You may also extend your competence in your discipline at the graduate level. You are also required to take SESAME 210 and to participate in the SESAME/EMST Colloquium. These activities should help prepare you for the preliminary exam, qualifying examination and your subsequent research.

SESAME 210 I Practicum

SESAME 210, Practicum in Science and Mathematics Education Research, is required of all first year students. This yearlong class serves as the professional development course to introduce SESAME students to educational research and methodology. The core-reading list for this course is the Preliminary Exam reading list that is put together by the SESAME Executive Committee. The reading list is supplemented by readings that cover methodology, current research topics of faculty in the department and papers by visiting speakers. The course provides students with an overview of SESAME through informal talks by current faculty and students, discussions of SESAME requirements and sharing of research projects by students in the class. This course should be taken for a letter grade.

Experience in Research

SESAME functions on the apprenticeship model--students learn to do research by active participation in research projects. In addition to the projects required in most courses, SESAME students are required to participate in the research projects of SESAME faculty. This can be accomplished through several different paths--by acting as a research assistant, through taking an independent study course to work on a faculty research project or through extra credit (up to 2 extra units) in SESAME 210. It is essential that every SESAME student develop a working relationship with the faculty. This not only develops research skills, but also will enable the student to put together an appropriate committee for the Qualifying Exam and the dissertation.

Advanced Studies in Your Discipline

SESAME graduates should be qualified to teach at the undergraduate college level and should therefore have competence in the fundamentals of their disciplines, roughly equivalent to that required for a master's degree. Already having a master's degree in a discipline would generally fulfill this requirement, but course selection will depend upon a student's long-term goals. For those with university teaching goals more course work in a discipline might be advised. Those students who expect to obtain administrative or policy positions may be required to supplement discipline requirements with courses in educational practice and policy. This requirement can also be fulfilled through competency demonstrated via a project or professional experience. The exact method for each student should be worked out in consultation with the student's advisor, the Graduate Advisor and the Qualifying Exam Committee.

Course Selection and Approval

To be considered full-time, a student would normally be enrolled for 12 units in the 200 series or above. Registration packets for new graduate students are available in the SESAME office in early August. There is a copy of the Schedule of Classes available in the SESAME office or one can be purchased at the ASUC Bookstore/Student Union. The School of Education publishes a separate listing of its classes that may be found both in their offices and the SESAME offices. You should also check in the SESAME office for additional courses that may not be listed in the class schedule. At the beginning of each semester you will meet with the SESAME Graduate Advisor or other designated person to review your study list.

Required Coursework

The SESAME program requires doctoral students to complete coursework in each of the following seven areas. These courses provide exposure to the major concerns and issues of this field of study. Students, in consultation with their advisor(s), choose from the list of approved courses under each category. Students who wish to substitute other courses to meet the requirements may petition the SESAME Executive Committee.

NB: Students must take required courses for a letter grade. A student's transcript is required to have a balance of courses with letter grades and pass/fail grades (or satisfactory/unsatisfactory) such that two-thirds of the course units have earned a letter grade.

First Year Seminar | two semesters during first year of enrollment:

SCMATHE 210 Practicum in Science and Mathematics Education, Research and Development (Gifford)

Colloquia | four semesters, taken in first two years of enrollment: (second year requirement added Dec '06)

SCMATHE 292 Research Seminar and Colloquium (SESAME Lecturer)

Individual & Social Cognition | one course: Courses involving a cognitive science approach to thinking, learning or instruction.

EDUC 226	Constructive Epistemology
EDUC 227	Metacognition
EDUC 229A	Problem Solving and Understanding (x-listed as Psychology 220D)
EDUC 229B	Cognitive Science Approaches to Learning
EDUC 229D	Discourse and Learning in Math and Science Classrooms
EDUC 229F	Conceptual Change

EDUC 232	Problem Solving and Understanding in Elem. School Classroom
EDUC 290C	Representations
EDUC 290C	Principals for Embodied Design
EDUC 290C	Neo-Vygotskian Perspectives on Cognitive Development
EDUC 290C	Cognitive Ergonomics in STEM Education Research

Discipline | one course: Project-based courses on learning and instruction in a particular subject area (mathematics, computer science, or one of the physical sciences). In addition to extensive readings, the student must conduct, report on, and write up an empirical study (an experiment, clinical interviews, models of out-loud protocols, field work, etc.) germane to the course.

EDUC 222A	Programming & Problem Solving
EDUC 224A	Mathematical Thinking and Problem Solving
EDUC 224B	How People Learn Computer Science
EDUC 290C	Scientific Thinking and Learning
EDUC 290C	Learning Chance: Computer-Supported Inquiry into Probability
EDUC 290C	Paradigmatic Didactic Mathematical Problematic Situations

Curriculum and Technology Design | one course: Project-based courses on the principled development of instructional materials. A major part of such courses is the production and/or evaluation a substantial piece of instruction.

SCMATHE 220C	Instructional Design in Science/Mathematics Education
EDUC 221A	Ambitious Instruction in Mathematics: Research into Practice
EDUC 221B	Curriculum Development & Instruction in Science
EDUC 222B	Design of Computer-Based Instruction
EDUC 290C	Scientific Cognition: Development, Learning & Instruction
EDUC 295B	Technology, Curriculum and Instruction
EDUC 290C	Design-Based Research in Mixed-Media Learning Environments

Methodology | three courses: two Qualitative Methods (at least one must be taken from Qualitative Methods A category) and one Quantitative Methods. Please consult with your faculty advisor when choosing methodology courses. May also apply for waiver based on previous or proposed coursework.

Qualitative Methodology A

EDUC 228A	Qualitative Methodology
EDUC 228B	Modeling of Knowledge and Cognitive Processes
EDUC 212	Cognition and Learning in Social Context
EDUC 288B	Theory and Methods of Field Work

Qualitative Methodology B

EDUC 290C	Modeling-Based Methodology for Design, Learning, and Research (approval pending)
EDUC 293V	Video-Analysis Seminar

Quantitative Methodology

EDUC 293A	Data Analysis in Education & EDUC 293 L Education Data Analysis Laboratory
EDUC 275	Data Analysis in Educational Research & EDUC 275L Educational Data Analysis Laboratory
PSYCH 205A	Data Analysis - Psychology

New courses that fulfill these requirements are regularly added, so check with the SESAME office for current information. Exemption from a requirement may be granted under special circumstances. To request an exemption, prepare a written justification and submit it for consideration by the SESAME Executive Committee and your faculty advisor.

At times there may not be an appropriate course that meets an individual student's needs in fulfilling a requirement. For instance, there is not currently an appropriate Discipline/Action-Oriented course for students with a biology or chemistry background. In such circumstances the student can work out a plan with his/her advisor to adapt an existing course to fulfill the requirement or to design an independent study with an appropriate faculty member. This should be submitted to the SESAME Executive Committee for approval.

Preliminary Examination

The Preliminary Exam occurs the spring semester. The exam is based upon the Preliminary Examination Reading List compiled by the Executive Committee. However, the Exam is more than just a review of the required readings. Students are expected to be able to analyze and synthesize what they have read in order to take a position on the main issues in cognitive and educational research. The exam typically consists of a written essay components and a one-hour oral 'debriefing' based upon the same questions answered on the written component. The exam is used as one source of information during the students' year-end evaluation. It provides the faculty with a common piece of work from each student and a basis upon which to judge if students have become socialized to the SESAME intellectual community.

Year End Review

At the end of each academic year, an evaluation committee that is composed of the SESAME Executive Committee and the main advisors of each student evaluates all SESAME students. The purpose of this evaluation is to determine whether students are making the expected progress through the program and what steps they may need to take to improve their progress. In preparation for this meeting, all students are requested to submit a current curriculum vita and an evaluation form that supplements the vita.

The first year students are evaluated with information from the Preliminary Exam, course work and reports from the first year advisors. It is essential that SESAME students stay in touch with faculty so that the evaluation committee can make an informed judgment about each student's progress.

After the evaluation committee meeting, each student is sent a letter that summarizes the committee's evaluation. This letter becomes part of the student's permanent file. A copy is also sent to the Graduate Division. In some instances the letter may specify certain things that a student should do to maintain good standing in the program. You should seek more detailed information about your evaluation from your first year advisor.

Colloquium and Seminar

The Group sponsors regular colloquia and seminars that are offered for credit through SESAME 292. Every first and second year student should plan to enroll in SESAME 292 (1 unit) and regularly attend the colloquia that meet on Monday afternoons. The Monday colloquia typically consist of a formal presentation by a speaker followed by a question and answer session. There are also less formal

seminars in which students present their work and address other topics of more local interest.

Experience Teaching

It is advised that you have some teaching experience by the time you receive your Ph.D. You may have already satisfied this requirement through professional work prior to enrolling in the program. If that is not the case, you may serve as a Graduate Student Instructor (GSI) in a course within your discipline or make other arrangements. Some alternative sources of teaching experience are the Lawrence Hall of Science and the Professional Development Program. Consult with the Head Graduate Advisor or SESAME Lecturer for more information on these options.

Professional Activity

You are strongly encouraged to become a member of professional organizations both in your scientific field and in a relevant branch of education. You are also encouraged to attend and present papers at conferences of such societies. Since the relevant organizations will vary by student interest you are encouraged to actively discuss this issue with the faculty and other students in order to find the most relevant activities for your professional development.

Review

Each year the SESAME faculty reviews each student's progress at an annual valuation meeting, as described under the first year-end review. Any student who is not making adequate progress (see section on normative time above) may be asked to leave the Program. It is essential that each student keep his/her faculty advisor up-to-date on his/her progress in order for the year-end evaluation to be a useful experience.

Qualifying Examination (Orals)

The Qualifying Examination will lead you to review and consolidate your learning. The purpose of the examination is to allow the faculty to evaluate your qualifications to independently undertake the dissertation project. Passing the exam signifies the faculty's decision that you are sufficiently knowledgeable and prepared to carry out dissertation research. The examination is normally taken during the third or fourth year of the program (see normative time above) and after most course work has been completed and other program requirements fulfilled.

Eligibility for Qualifying Examination

You must be a registered student in good standing, have at least a B average and no more than two courses graded Incomplete, and have been in residence for at least one semester.

Procedure

1. Your Qualifying Examination Committee and topics must be approved both within SESAME by the Graduate Advisor and by the Graduate Division of the University. First meet with your faculty sponsor, other SESAME faculty, and faculty from your discipline to discuss which topics you will choose to be examined on, who will serve on your committee, and who will guide you as you study for the examination and prepare your qualifying paper.
2. You may find the Plan for Qualifying Examination form helpful in selecting your Qualifying Examination Committee. After selecting the committee and possible topics and arranging an examination date, complete the Application for Qualifying Examination form, obtain the signature of the Graduate Advisor and submit the form to the Graduate Division for review.

Qualifying Examination Committee

Your Qualifying Examination Committee consists of four members selected by you and your faculty sponsor (under exceptional circumstances and only for compelling reasons, a fifth person may be added at the discretion of the Dean of the Graduate Division). You must select a Chair of your Qualifying Examination Committee who is a member of the UCB Academic Senate; the Chair cannot be the person who will later serve as your dissertation advisor.

At least two members of the Qualifying Examination Committee must be SESAME faculty members, and at least one member of the committee must be on the SESAME Executive Committee. The Graduate Division requires that you designate one committee member as the "outside" member. A Berkeley Academic Senate member who is not also a member of the SESAME Group would qualify as the "outside" member. Your committee includes your faculty sponsor, typically a faculty member from a related field such as education or psychology, a faculty member in your discipline who may, but need not, be a member of the Group, and another faculty member. The Graduate Division can approve faculty from other UC campuses and from other institutions if justification is provided. A committee with two non-Senate members (i.e., lecturers or researchers) is not likely to be accepted by the Graduate Division.

PART A: Oral Examination

Topics

One section of the exam is an oral examination in which the student is expected to show competency in three areas: 1) broad educational issues 2) scientific domain knowledge 3) the specific educational arena in which the student proposes to do the thesis work. The oral exam typically lasts three hours, with roughly one-third of the time dedicated to each component.

In the area of broad educational issues, the student and the committee will agree upon a set of issues for examination and a reading list of relevant papers and books. The exam will focus upon but not be limited to these issues and readings.

If the student entered the program with a Master's degree in his/her discipline, the subject domain component of the exam might be quite brief. Otherwise it will take up about one third of the total exam time. The purpose of this component of the exam is to insure master's level competency within a scientific domain. Discussion with the committee about the relevant topics is advised but not required for this part of the exam.

In preparation for the third component of the oral exam, the student should submit a 10-15 page (double-spaced) description of the proposed dissertation research including a characterization of his/her area of interest and expertise, a description of outstanding problems in the domain, a discussion of issues ripe for fruitful investigation, of ideas to be pursued in the thesis work, and a proposal for the pilot study, including some specific details regarding proposed instruments or methodological techniques. This component of the exam requires that the student be quite close to formulating the final dissertation plan. The exam meeting gives the student an opportunity to receive feedback on the proposed research in preparation for writing the official dissertation proposal,

Oral Examination Procedures

The examination begins with a brief discussion of a plan for the order in which your three topics will be addressed and the procedure by which the committee will conduct the questioning. Remember that you have the right to change the order in which topics will be addressed in the event the committee's plan does not feel comfortable to you. Be prepared for the possibility that you will be asked to leave the room for a short time in the beginning, middle, and end of the session while the committee plans the examination procedure, assesses the progress of the examination, and evaluates your performance.

The committee then poses questions in each topic area, including probes for expansion or defense of statements in your qualifying paper. During the questioning you can always request clarification of questions if you are not sure what you are being

asked. In part, the questioning is meant to raise your awareness of issues and problems in your areas of interest; you are not expected to "know all the answers." In fact, it is a positive result if your most honest response to some questions is, "I don't know-I will have to think about that."

If a direct answer to a committee member's question is not apparent, or of interest to you, it is appropriate to offer a response to a related question which you do wish to discuss. You are not being evaluated on the "correctness" of every answer so much as on the overall impression you are giving of your background and ways of thinking about your areas.

There are four possible outcomes of your examination:

Pass. The committee agrees unanimously that you are qualified to proceed to the next step in the program, preparation of your dissertation proposal. Some suggestions might be offered with regard to areas you may work to strengthen in your remaining time in the program.

Partial Failure. The committee may conclude that your preparation in one or more areas is not adequate; hence you should study further and be reexamined on that section within a specified time period.

Total failure. The committee may conclude on the basis of your oral and written performance that you have not demonstrated sufficient competency to proceed in the program. In such a case, you are provided justification of this decision.

4.A Split Vote. If the committee cannot reach a decision, the chair should determine the areas of disagreement, and each committee member must write a detailed assessment of the student's performance for submission to the Administrative Committee of the Graduate Council.

Some Suggestions

Get to know your committee members in individual meetings before your examination. Discuss your interests, and find out what kinds of concerns each member has.

Talk to other students who have been through the qualifying examination. Develop realistic expectations about the scope and depth of questions typically posed. You might arrange to have a mock examination with your peers in SESAME before your meeting.

Be more concerned with general issues than specific facts. Some of the most difficult questions are very general - for example, "What do you mean by (topic area)?" "What should be the syllabus for an introductory course in (topic area)?" "What progress is being made in advancing our understanding of (topic area)?" "Based on

your reading, what advice would you give a teacher who wants to improve instruction in (discipline)?

PART B: Defense of Dissertation Proposal

The second part of the Qualifying Exam is the approval of the Dissertation Proposal. It is SESAME policy that this part of the exam must be completed within 3 months of the oral exam. In fact, it is possible to complete this part of the exam prior to taking the oral examination, but it is recommended that you complete the oral component first.

For this part of the Exam the student is expected to produce a research proposal similar to a professional grant proposal such as those written for the National Science Foundation. The main body of the proposal should be no more than 30 double-spaced pages, and, if appropriate, include various appendices that provide technical details. It is strongly suggested that you prepare a budget detailing costs for carrying the project to completion. These costs may include duplication of instructional materials and tests, production of laboratory equipment, payment to experimental subjects, data analysis, audio- or videotapes for recording observations, and salaries for research assistants. You are also expected to include a statement concerning compliance with the regulations of the Committee on Protection of Human Subjects.

Often, but not always, the student is expected to collect pilot data in order to test out the proposed methodology. The decision about whether and how to conduct the pilot study should be made in consultation with the dissertation committee.

Proposal Review Meeting

A four-person committee including your dissertation advisor, a SESAME faculty member, a faculty member from your scientific field, and a faculty member from a related field such as education or psychology carry out the proposal review. At least one committee member must be a member of the SESAME Executive Committee.

You must schedule a formal two-hour meeting for review and discussion of your proposal. Be sure to have the members selected and an acceptable date established with sufficient time to allow the committee to read the proposal in advance. Frequently, the committee will decide at the review that minor or major changes are needed in your proposal, that revisions should be made with the guidance of committee members, or that another meeting of the entire committee would be useful to discuss a revised version of the proposal.

Suggestion: If you are having trouble reconciling the advice from the various members of your committee, it might be a good idea to have an informal pre-meeting with the committee. This might help in achieving a consensus on the direction of

your research. It is also a good idea to have your peers read your proposal and give you feedback before the proposal approval meeting.

Advancement to Candidacy

Upon passing the Qualifying Exam, you must file for advancement to candidacy. Plan B, Application for Candidacy for the Degree of Doctor of Philosophy form will be sent to you by the Graduate Assistant upon passing your Qualifying Exam. The Graduate Advisor and your Dissertation Chair must sign the form. Return the form to the Graduate Division in person or by mail; a candidacy fee must be paid at the time of filing the application.

Once you have advanced to candidacy you may be eligible for the Dean's Normative Time Fellowship. More information can be found here <http://www.grad.berkeley.edu/policies/dntf.shtml>.

DISSERTATION

Your dissertation is the result of a major piece of research that typically requires two or three years to complete. The project begins with the selection of a research area and preparation of a Dissertation Proposal, which should take about six months. For a year or two after that you will be engaged in empirical and/or theoretical studies. The final six to twelve months will be required for you to write the dissertation and have it reviewed by your Dissertation Committee. The writing of the dissertation should be considered an integral part of the research process. Frequently parts of the dissertation can, and should be, written during the final stages of the research (e.g., during data collection and interpretation).

Supervision of Research

For assistance during your dissertation research, you will have a three-person committee who must represent at least two instructional units. Your dissertation advisor usually chairs this committee. Since the Graduate Division requires that the chair be a member of the Berkeley Academic Senate, you may need co-chairs if your dissertation advisor is not an Academic Senate member. The committee usually includes two other members of your dissertation proposal committee and the designated "outside" member must also be a member of the Berkeley Academic Senate. Faculty from other campuses may be included if their special knowledge justifies this step. Keep in touch with your committee members as you work on your research and writing.

You are encouraged to publish papers and participate in professional society meetings to expand your contacts while you are a student. In such activities it is important that you identify your membership in the Group and give proper acknowledgment of any financial support from which your work has benefited. Check with your

advisor or the Chair of SESAME concerning this matter before you submit any items for publication or presentation.

Current SESAME Faculty and Areas of Interest

Dor Abrahamson, Ph.D. Northwestern University.

Mathematics cognition through the lenses of design-based frameworks.

(Education) <http://www-gse.berkeley.edu/faculty/dabrahamson/dabrahamson.html>

Norma Ming Ph.D. Carnegie Mellon University.

Cognitive processes in math and science problem-solving. (Lecturer, Education)

Alice M. Agogino, Ph.D., Stanford University.

Artificial intelligence and expert systems, design theory and methods, probabilistic design, nonlinear optimization, concurrent engineering, supervisory control, diagnostic and monitoring systems, engineering education, qualitative reasoning, computer-aided design. (Mechanical Engineering)

<http://www.me.berkeley.edu/faculty/agogino/index.html>

Marian D. Diamond, Ph.D., University of California, Berkeley.

Neuro-anatomy; environment, asymmetry, and hormones (Physiology-Anatomy)

http://ib.berkeley.edu/research/interests/research_profile.php?person=57

Andrea A. diSessa, Ph.D. Massachusetts Institute of Technology.

Physics and computation cognition (Education)

<http://www-gse.berkeley.edu/faculty/AAdiSessa/AAdiSessa.html>

Randi A. Engle, Ph.D. Stanford University.

Classroom discussions in science and mathematics (Education)

<http://www-gse.berkeley.edu/faculty/RAEngle/RAEngle.html>

Bernard R. Gifford, Ph.D. University of Rochester.

Policy analysis, technological education (Education)

<http://www-gse.berkeley.edu/faculty/BRGifford/BRGifford.html>

Marcia C. Linn, Ph.D. Stanford University.

Cognitive processes; science, computer instruction (Education; Chair and Head Graduate Advisor for SESAME)

<http://www-gse.berkeley.edu/faculty/MLinn/MLinn.html>

Michael Ranney, Ph.D. University of Pittsburgh.

Reasoning, learning, cognitive science and society (Education)

<http://www-gse.berkeley.edu/faculty/MRanney/MRanney.html>

Alan H. Schoenfeld, Ph.D. Stanford University.
Problem solving, metacognition, mathematical cognition
(Education and Mathematics)
<http://www-gse.berkeley.edu/faculty/AHSchoenfeld/AHSchoenfeld.html>

Angelica Stacy, Ph.D., Cornell University.
Chemistry curriculum reform; teaching assistant professional development
(Chemistry) <http://chem.berkeley.edu/people/faculty/stacy/stacy.html>

Barbara Y. White, Ph.D. Massachusetts Institute of Technology.
Science education: cognition, computers (Education and Computer Science)
<http://www-gse.berkeley.edu/faculty/BYWhite/BYWhite.html>

Affiliated Members of the SESAME Group:

Michael Clancy, Senior Lecturer, Electrical Engineering and Computer Sciences
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Deborah Nolan, Professor, Statistics
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Lisa Pruitt, Professor, Mechanical Engineering
<http://www.me.berkeley.edu/faculty/pruitt/> lpruitt@me.berkeley.edu

Career Path of Graduates

Graduates of this program take leadership roles in promoting educational innovations in academic, industrial, and museum settings including the Exploratorium and the Lawrence Hall of Science. SESAME graduates often teach in two- or four-year colleges or universities. Others are

directing educational programs of science museums or similar institutions that offer programs for the general public. Still others are active in educational research and curricular development, in industrial training programs, or in their own consulting businesses.

Who to contact for more information

For additional information about the program contact the SESAME/CD office at the Graduate School of Education, 4533 Tolman Hall, MC 1670, tel: (510) 642-4207, or email SESAME Program Assistant, Kate Capps: smeinfo@berkeley.edu.

Graduate Admissions Web site: <http://www.grad.berkeley.edu/prospective/index.shtml>

If you would like to get in touch with current SESAME students simply email: cdstudentinfo@list.berkeley.edu. Contact information for current students will be sent to you. Students can provide a perspective on graduate student life and their experience at Berkeley, as well as answer many of your questions. In your email, please specify that you would like to receive contact information for SESAME students.

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