

# **Experimental Study Group Seminar Series: An Experiment in Active Education at MIT**

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September 29, 2006

## **History of the ESG seminar series**

The Experimental Study Group is an alternative learning community at MIT which offers a more personal approach to first year education than is provided in the mainstream curriculum. ESG was established in 1969 in response to student and faculty interest in providing a more interactive and student-centered environment where students and faculty could connect with each other in collegial and informal ways. The program is designed to offer instruction in the core freshman subjects at MIT (two terms of mathematics, two terms of physics, one term of chemistry, and one term of biology) through small classes taught by a faculty, lecturer, graduate student, or upperclassmen experienced in teaching.

With the encouragement of Professor Kim Vandiver (Director of ESG from 1984-1989) and Professor Vernon Ingram (Director of ESG from 1989-1999), the Experimental Study Group began to create and offer a series of undergraduate seminars in addition to the core subjects we normally offered. Seminars are based on the idea that good education is relevant to what excites students and staff, has a hands-on component whenever possible, and is best done in small, interactive groups with plenty of opportunity for student input. Seminars were designed and run not only by ESG staff, but also by former ESG students and alumni. The seminars included a wide variety of topics in areas as diverse as the visual arts, music, psychology, chemistry, education, political science, engineering, religion,

mathematics, anthropology, and physics. Some are team-taught (this current year, four of our seventeen seminars were team-taught). An early and somewhat unusual example of team-teaching in our seminar series occurred in 1986, when a Viet Nam veteran, a conscientious objector, and a Vietnamese national team-taught a seminar on the Viet Nam war. The seminar series has been funded primarily by contributions from alumni, an exciting use of alumni funds which keeps them closely connected to MIT and ESG.

## **Structure and content of the seminars**

Although each seminar is different, there are several elements that are core to the way they are taught that makes them active and interactive. Seventeen six-unit seminars were offered in the spring of 2006. The syllabi from these seminars can be obtained from Dr. Holly Sweet ([hbsweet@mit.edu](mailto:hbsweet@mit.edu)). The chance for staff and student instructors to develop a subject on material of their choosing that is unique at MIT is a wonderful way to engage teachers in “teaching from their passion.” When people teach what they are most interested in and students take what interests them the most, the educational process is dynamic and exciting.

The structure of the seminars includes the following active aspects of education:

- Student projects and in-class student presentations (such as presenting material of one’s choosing and leading class discussions)
- Opportunities for students to teach a section of the class
- Public exhibitions and performances (such as hanging an art show or performing a rhythm and blues concert)
- Hands-on work (such as doing physics experiments, cooking, creating chain mail, designing robots, painting, learning Kyudo, or taking photographs)
- Education outside of the classroom (attending local religious services and visiting the Museum of Fine Arts to see a David Hockney exhibit)

The interactive aspect of our seminars is also important in terms of creating an educational environment which is exciting for students. Aspect of interaction included small group discussion found in classes such as SP.260 Women's Novels and group exercises found in SP.240 Composing Your Life. When students and faculty are involved in a collaborative and creative effort, it helps students become truly involved in what they are learning. It becomes part of them, they become part of the class, and they are invested in what is being taught because they are a crucial part of the process – this is active education at its best. The chance for team teaching is also a good opportunity for instructors to share ideas and bring in material from their own disciplines. For example, team-teaching was used this year in SP.240 (a psychologist and a photographer), and SP.262 (a physicist and a graduate student in Electrical Engineering). Last year, SP.249 Alternative Education, was team-taught by teaching staff from two different educational institutions (MIT and Wellesley College).

Finally, ESG sponsored residentially based seminars (SP.287 Kitchen Chemistry and SP. 240 Communication: A Two Way Street) in several dorms around campus over the past few years, including New House, Simmons Hall, East Campus, Bexley, and Baker. The opportunity to combine academics in a residential setting is important for it fights the misleading conception of many students that education is only done in a traditional classroom setting.

### **Administration of the ESG seminar series**

Each fall, the ESG administration solicits proposals from ESG faculty and students for spring term seminars. Proposals are due by November 1<sup>st</sup> and need to include the following items: title, 13 week syllabus, description, faculty supervisor (if student-run), and budget. Proposals are reviewed by the ESG administration (Professor Alex Slocum, Dr. Peter Dourmashkin, and Dr. Holly Sweet). Proposals are selected on the basis of clarity, previous teaching experience, and perceived interest in the

subject material. Students must have been part of ESG as freshmen in order to propose a seminar.

Once seminars are accepted, they are assigned a special topics number (SP.234-SP.299) if they don't already have one and are reviewed by the Committee on Curricula. If accepted, they are added to the MIT database. If the seminar has been taught before, it is entered into the MIT database as soon as the proposal is accepted. Supervisors and their supervisees review the syllabi to ensure quality control of what is offered.

Budgets are reviewed to make sure that we have adequate funding. In the past, no limit was placed on the number of seminars offered in the spring term. This past year ESG sponsored 17 seminars which proved too taxing on the program's financial resources and personnel. The cap for spring term seminars is now set at a maximum of 14 seminars. The typical budget for 14 spring term seminars is around \$53,000. Most of the funding for ESG seminars comes from donations from ESG alumni: the rest comes from a grant from the Dean of the School of Science.

### **Evaluation of the seminars: from the student viewpoint**

Based on their midterm and end of term evaluations, students continue to be very enthusiastic about their experience with the ESG seminars. Listed below are a few sample comments from end of term evaluations for seminars taught this term at ESG.

- *I like the opportunity that each of us had to give a short lecture on a topic. This gives us a valuable teaching experience. (Lies and Statistics)*
- *Excellent subject! It's great to bring science into the quotidian. We covered the frequently encountered principles of cooking and baking so were always dealing with applicable subject matter. (Kitchen Chemistry)*

- *It was interesting to focus on various aspects of our lives that we hardly ever think about. Everyone should take a self-exploration class. (Composing Your Life through Visual Arts and Writing)*
- *Teaching was very open and very student-run, which made the class very interactive – everyone was brought to a good level of participation (History of Rhythm and Blues)*
- *I enjoyed the class because the instructor encouraged us to do our own experiments and planning. It was a good introduction to engineering for me. (Physics of Rock Climbing)*
- *It was thought provoking, relevant to what we are doing at MIT, and helped us think about how we can apply that knowledge to help less fortunate people and countries. (Information and Communication Technology in Africa)*
- *This class exposed me to a lot of things that I wouldn't typically encounter in an MIT class (science especially). It was a wonderful opportunity to practice and learn about Zen philosophy and history, painting pottery and especially Kyudo. The focus on Zen philosophies was refreshing in a high-stress environment like MIT.(Zen Arts)*

## **Evaluation of the seminars: from the instructor viewpoint**

Peer teaching is one of the hallmarks of ESG and has had a long and positive history. Beyond acting as teaching assistants and tutors for staff and faculty, exceptional students are given the opportunity to actually design and teach pass/fail seminars under close staff supervision. Upperclass instructors find the opportunity to actually design and teach a new subject at MIT very rewarding.

- *Teaching SP.272 (Culture Tech) has been one of the most rewarding parts of my MIT experience. It makes me feel like I've been able to truly create something to give back to the MIT community, and that the community values this from me. (Heather Jones, June 2006)*

- *The ESG Seminar Series is a fun and stimulating way for students to explore Topics of interest and incorporate those interests into their academic studies. Teaching a seminar helped improve my organization and communication skills and required that I learn much more about the topic than I did as a student. (Colin Dillard, June 2005)*
- *Teaching seminars at ESG has been the highlight of my MIT undergraduate experience. After all teaching is just learning in disguise but with the added bonus of knowing that the learning is happening in both me, the instructor, and my students at the same time...Teaching a seminar is not only about exposing students to novel ideas and interesting topics but it is also about getting to know them as individuals and being able to interact with them on a personal level. In the busy academic environment of MIT it is rare to find the sort of personal interaction, small class size and caring so often found at ESG in general and in seminars in particular. (Nadezhda Belova, June 2006)*

Staff instructors enjoy the opportunity to develop new seminars, often outside their normal area of expertise, to team-teach with someone from a different discipline, and to be able to grow professionally by exploring new topics.

- *I opted to teach the Physics of Rock Climbing on account of both my expertise in the subject matter and the potential the subject has for engaging undergraduates. Teaching SP.255 has forced me to organize my knowledge of the subject and allowed me to pursue research in the field. (D. Custer, June 2006)*
- *Seminars are a creative outlet for my growth and development as an educator. It gives me an opportunity to interact with students who really want to learn the subject. It gives me the chance to teach students outside of ESG. Because the seminar topics are chosen by me, they give me an outlet to explore areas that directly interest me, providing me with a chance to grow intellectually. In Kitchen Chemistry, I was the expert, and in Alternative Education, I was learning along with the students. (Dr. Patricia Christie, June 2005)*

- *Teaching Special Topics in Mathematics was a refreshing way to teach a new subject. Team teaching is enjoyable and a good way to grow as a teacher. Leading discussions on the creative process was very different from the type of discussions we have in our math classes. For us this was a bit of a stretch and it will have a positive impact on our math teaching.* (Dr. John Lewis and Dr. Jeremy Orloff, May 2005).

## **The value of the ESG seminars**

As of this current year (2005-2006), the seminar series has become a very important part of ESG's experimental emphasis, offering an ESG-type experience to over 100 non-ESG students a year, including undergraduates at MIT and at Wellesley College. In addition, it offers undergraduates the rare but valuable opportunity to design and offer a for-credit subject at MIT. Students who take one of the ESG seminars typically say they value the opportunity to engage intellectually on a new topic with other students and staff in an informal and interpersonal setting. They often end their evaluations with a sentence about "why aren't more seminars like this offered at MIT?" Although 50% of the freshman class participate in one of the freshman advising seminars offered through the Academic Resource Center, few undergraduates have the opportunity to take part on a small, interactive seminar that is not directly related to their major.

The importance of student input cannot be underestimated. Too often students in higher education are simply given things to do and become passive recipients in the process. Creating the opportunity for hands-on experience in the classroom is important, especially in institutions like MIT that do not emphasize experiential or interactive education. The value of team-teaching from different disciplines is tremendous, not only for the students who are exposed to different views on the same subjects but also for the instructors who learn from each other. Project-based education (including public exhibition of student work) is valuable as a learning experience both personally and academically. It is an exciting experience and gives

validation to student work in a way that does not always happen when assignments are only viewed by the instructors. It is also an excellent group bonding experience and gives students the chance to integrate the term's material in a creative fashion.

The importance of studying new materials not typically offered at MIT is also important. From student evaluations, it is clear that students really appreciate learning material not found elsewhere at MIT, especially when it is presented in a low-stress way. Many students remark that the seminars were "a breath of fresh air" from classes that they perceived as tedious and a curriculum that they felt was too one-sided.

Seminars offered through ESG can affect real change in students' lives personally and professionally and, in certain cases, have an impact on the world at large. For example, material from SP.253 (AIDS and Poverty in Africa) has been used by key public policy makers in Zambia. The material developed in SP.240 (Composing Your Life) is the basis of a book which is currently being drafted and could be used in classrooms and student life centers around the country once it is published. When highly motivated students and staff are given the opportunity to explore what they are most passionate about, wonderful things can happen. ESG is part of a process of creative change in MIT undergraduate education, a change which focuses on a more active and involved role in education for students. ESG community members welcome the opportunity to continue to work towards active and experiential education for all students.