The EXPLORE Program - Introducing High School Women to EET

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Abstract - As more women enter the traditionally male dominated fields of science and engineering, it is a curiosity that they are still rare in Electrical Engineering Technology, EET. Part of the reason, it would appear, is that the program is not well publicized at the time young women are making the decision about what course of study they will pursue. As part of an effort to introduce high school aged students to the field, the EET Department at Purdue University has initiated a summer mini-camp for women called the Explore Program. This three-day exploration was designed to inform, entertain and challenge. It provides a unique opportunity for exposure to the campus, faculty, and course work. What follows is a summary of the preparations, activities, responsibilities, costs, and results of the first year's experiences. An appendix provides guidelines and a suggested timeline for any other university department wishing to start a similar camp.

Introduction - One of the most striking features one may notice when visiting the Electrical Engineering Technology Department at Purdue University is the homogeneity of its student body. Fewer than four percent of the EET student body consists of women. Clearly students would be well served to study in an academic setting that is representative of the world in which they will work. It is unlikely that EET graduates will work in a exclusively white male environment and yet that is the make-up of many of their classes.

The EET program at Purdue affords its graduates a wide variety of job opportunities. Starting salaries for EET graduates average in the thirty thousands. Female graduates are highly sought out by industry recruiters. Ideally anyone with the desire and talents to succeed in this program would have access to it. Apparently, however, young women are not aware of the opportunities provided by this discipline at the time they are making choices concerning their education. This is manifested by the fact that most of women in EET transfer in from the Electrical Engineering department, where there are many more of them. It would be better for all concerned if they had the information to make EET their first choice.

In the interest of informing high school-aged women of the opportunities that exist for them in EET and in the interest of obtaining more balance in the classrooms, the EET Department at Purdue University has initiated the summer mini-camp, The Explore Camp. The first camp was held over three days in June, from Sunday afternoon to Tuesday afternoon. The goal of the Explore Camp is to increase enrollment of female students in EET by increasing their knowledge, interest, and confidence regarding technical fields. First year objectives included:

- Laying the foundation and developing a model to serve for years to come. (This included: staff, funding, and program development.);
- Attracting high-caliber female students to participate;
- Piquing interest and spreading information concerning EET in a friendly, relaxed environment.

Not all of these were easily measurable, at least not in the first year.

The Results and Follow-Up

The participants evaluated the program immediately upon completion. This evaluation provided the following information:

> The participants were unexpectedly talented. Four of the young women had 4.0 grade averages. They were prepared for even more challenge than we provided.
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> Interactive experiments were preferred to demos.
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> It is important to keep things moving. If not all campers could participate in an activity at one time then the others should be provided with something to occupy them during the wait.
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> Logistics need to be kept in mind. Occasionally the girls had to walk very long distances between activities.
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> The explorers were eager to communicate with each other after camp so a list of names and addresses will be provided at this year's final luncheon.

The first Explore Camp was deemed a success even though some of the participants felt that they would not be pursuing an education in EET. This is probably due to the fact that as a group they were unusually qualified and will have more options than most students. They were wonderful to work with and reportedly enjoyed the experience. It has been decided to form an alumni association for the past participants. If the participants are asked to sign photo releases the pictures shot during camp can be incorporated into the next year's brochure and news letters. The news letters will be sent to past campers, teachers, and counselors, hopefully prompting them to spread the word to future participants.

Budget - An anticipated budget for the 1996 EXPLORE camp is outlined below. This budget is based on twenty campers. The fees for each camper will be two hundred dollars, one hundred of which will probably be offset by a scholarship supported by a local industry partner.

ITEM	COST
Faculty/Staff	$1750.
Brochures	500
Postage	200
Housing	425
Meals	610
T-shirts	210
Registration services	34
Co-Rec Access	45
Photographs	70
Teaching/lab materials	500
Final Lunch	150
Snacks	30
Transportation	100
Miscellaneous	200
Total	**$4824**

The Agenda

Sunday

3:00 **Check-in at dorm** Female EET students were on hand to welcome the explorers and assist them with their bags to their rooms. Camp staff were also present to talk with the parents and invite them to the final luncheon, instruct them regarding pick-up, etc.

4:00 **Introductions** The explorers participated in two activities designed to get them talking and learning about each other and the staff members. One activity was Get-to-Know-You Bingo. Facts about the campers and staff were arranged in bingo card style and each participant had to ask others if a specific entry on the bingo card referred to them. If they had found the correct person they wrote that name on the card. These facts were obtained from the application information and subsequent correspondence. The second activity, The Human Knot was for women only and provided plenty of amusement to relieve any tension remaining at this point.

5:00 **Dinner** All participants ate together in the dormitory cafeteria.

6:30 **Flight Simulator at Airport** The Explorers were taken to the Purdue Airport where they each took a turn flying the Boeing 727 Flight Simulator. There were a few crashes but no one was hurt. At this and other tours/activities every opportunity was taken to draw the campers' attention to the technical aspects of the equipment.

8:30 **Orientation** A faculty member provided a general description of EET and the differences between EET and EE disciplines and jobs. The itinerary was reviewed and a residence hall counselor ran through general rules regarding life in the dormitories.

9:00 **Movie** The explorers relaxed with snacks and a video before retiring for the evening.

11:00 **Lights Out**

Monday

7:00 **Breakfast**

8:00 **Campus Explorations** The explorers were taken on a walking tour of the campus and went on a tour of the athletic facilities including the scoreboard operation at the football field.

9:00 **Tour Elliot Hall of Music** **11:00** **Tour of Radio Station** A behind-the-scenes look at what is required to support the audio and lighting aspects of theater/concert productions and the campus radio station fascinated the campers and provided another opportunity to draw in the technical theme of the camp.

12:30 **Lunch** The campers were left to eat in the dorm by themselves. This gave them the opportunity to be coeds without constant supervision.

1:30 **Laboratory Explorations** At this point the campers were taken from one EET lab to another, each time getting a mini-lecture and participating in an activity representative of the work they would be exposed to as freshmen. In one lab they discussed sound waves and what the spoken word looks like on an oscilloscope. They each spoke the same word into a microphone for comparison and then they each spoke their names and these were stored and printed for them to take. In another lab they observed the differences between Radio Frequency (RF) and Infra-Red (IR) transmissions and how they are (or aren't) affected by obstacles in the line-of-sight. In the third lab, a computer lab, they were introduced

to the Internet and the World Wide Web. Some participants "talked" with people across the country while others accessed information about friends at other universities and others were given interesting web sites around the world to explore. In another lab they were given an opportunity to develop soldering skills that would be needed the next afternoon.

4:00 **Co-Rec** After spending most of the afternoon sitting the campers were taken to the gymnasium to burn off some energy. Tennis, swimming, weight equipment was all at their disposal. It also provided an opportunity to mix with the few college students that were around.

5:30 **Dinner** At dinner each camper was given paper and pencils to write down two questions to be asked of the graduate panel. These questions were their "entry requirement" to the next room.

7:00 **Graduate Panel** EET graduates, male and female, were present to talk with the campers about careers in EET.

9:00 **Freetime** The explorers were given their choice of going off campus (not far) to do some shopping at a nearby strip mall frequented primarily by college students or going to the Union to bowl, watch TV, and generally hang out. At this time all the campers were required to wear their camp T-shirts for ease in keeping track of them.

11:00 Lights Out

Tuesday

7:00 Breakfast

8:15 **Project** The explorers were divided into three groups, each with a faculty advisor. They were told they were part of a marketing group and that the technology group had just invented a widget that would digitally record and play back voice messages. The girls were to come up with a product, packaging, and marketing ideas to sell this widget. Each small group was given an opportunity to sell their ideas to the whole group. After this exercise each camper was given the widget, predesigned packaging and lab instructions. They soldered and assembled their parts and went home with a hand-held, 10 second message recorder/player.

11:30 **Luncheon** Campers' parents were invited to join the group for a small ceremony celebrating the successful completion of the first-ever Explore Mini-Camp. Entertainment was provided in the form of a video so that the parents could see what their daughters had been doing. Group pictures were taken and an evaluation was completed by the campers.

A step-by-step plan for implementing your own camp

Six months ahead

Select staff and determine camp dates It is of primary importance to select camp staff that are enthusiastic and can readily establish a rapport with the campers. Then according to participant schedules and residence hall availability select a date.

Layout Brochures - Include pictures of previous participants and camp staff members with description of activities and staff. The brochure could include a tear-off application, stating the application fee, a must to reduce no-shows, and a medical release statement.

Establish a budget and begin lining up financing. Include staff reimbursement, residence hall fees, extra meals, snacks or final luncheon, activity or recreational fees, transportation, project supplies, pictures, videos, awards, etc. Based on the costs and the support available determine camp tuition.

Four months ahead

Send out brochures to highschool math teachers, science teachers, & counselors. Respond to applications as they come in.

Make reservations at residence halls.

Recruit student help. It is a great benefit to have older students around to help. They can take photographs to be given as momentos and provide a non-threatening means of obtaining information for the campers. Because camp is held during break, the availability of student assistance may be limited. Early requests help.

Investigate campus tour possibilities. Get on the calendar with the organizations involved.

Begin evaluation of possible projects. All lab experiments, tours, discussions, even T-shirts were chosen with the theme of the main project in mind.

Two months ahead

Line up Industry Panel speakers. Make provisions for reserves.

Verify reservations at residence halls. Check into cancellation policies and final commitment dates. Determine which meals will be taken at the hall, which are to be packed, etc. Inquire about check -in and check-out times and supervision requirements.

Verify student help. Back-up assistance is prudent. Students were on hand the first day to welcome the explorers and through-out the camp to help corral and entertain.

Verify arrangements for campus tours or other facilities to be visited. Be certain to speak with the people that will be involved with the tour personally. Make time constraints clear. If possible take the tour with another group to be assured of its pertinence and time requirements.

Select a project and begin writing a lab procedure**.** All lab experiments, tours, discussions, even T-shirts were chosen with the theme of the main project in mind.

Design a logo and order T-shirts These tied into the theme of the camp and were issued to staff, student assistants and participants. When the group went off-campus it was required that they wear the shirts to lessen the chance of someone getting left behind.

Make arrangements for local transportation. Try to make the transportation as flexible as possible.

The final month

Touch base with everyone involved. Mail letters to campers informing them of itinerary, things to bring (casual clothes, swim suits, tennis equipment, spending money, etc.). Provide maps to the participants with detailed instructions concerning drop-off and pick-up times. If the parents/guardians are expected to attend a final program be sure to include relevant information.

Choreograph entire timetable, identifying which staff members will be with the campers at all times. Verify that all rooms, meals, transportation, etc. are in order.

Prototype project and run through lab demos. Procure all necessary equipment and supplies for project and begin writing a lab procedure**.**

Be certain paper work is in order. This includes medical releases, emergency numbers, etc.

At drop-off time

Require complete payment, remind parents of pick-up times, places and any final activities to which the parents are invited.

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