

ED 399 187

SE 058 940

AUTHOR Ocif, Jennifer; Marshall-Goodell, Beverly  
 TITLE Combining Mentoring and Service Learning - A New Approach.  
 PUB DATE [Jun 96]  
 NOTE 5p.; Paper presented at the National Conference of the Women in Engineering Program Advocates Network (June, 1996).  
 PUB TYPE Reports - Descriptive (141)  
 EDRS PRICE MF01/PC01 Plus Postage.  
 DESCRIPTORS Elementary Secondary Education; Engineering Education; Experiential Learning; \*Extracurricular Activities; Higher Education; \*Mentors; \*Outreach Programs; Science Activities; Science Education; Sex Differences  
 IDENTIFIERS \*Gender Issues

## ABSTRACT

Service learning refers to a form of experiential education that emphasizes for students the importance of accomplishing tasks that meet the needs of others. This paper describes the Service Learning Projects developed by the University of Iowa's Women in Science and Engineering (WISE) program. The purpose of the program is to design, implement, evaluate, and disseminate a model program for helping educators in extracurricular settings present science activities that will interest and challenge elementary and secondary school girls. The projects aim at increasing the awareness of gender issues in science, engineering, and mathematics; promoting gender-equitable teaching in science at all levels; placing science education in the context of the community; extending the scientific and technical resources of the university into the community; and increasing the visibility of female scientists and engineers. (JRH)

\*\*\*\*\*  
 \* Reproductions supplied by EDRS are the best that can be made \*  
 \* from the original document. \*  
 \*\*\*\*\*

## COMBINING MENTORING AND SERVICE LEARNING - A NEW APPROACH

Jennifer Ocif, Graduate Assistant  
Beverly Marshall-Goodell, Ph.D., Program Coordinator

PERMISSION TO REPRODUCE AND  
DISSEMINATE THIS MATERIAL  
HAS BEEN GRANTED BY

J. Ocif

TO THE EDUCATIONAL RESOURCES  
INFORMATION CENTER (ERIC)

Women in Science and Engineering Program  
The University of Iowa  
Iowa City, Iowa

U.S. DEPARTMENT OF EDUCATION  
Office of Educational Research and Improvement  
EDUCATIONAL RESOURCES INFORMATION  
CENTER (ERIC)

This document has been reproduced as  
received from the person or organization  
originating it.

Minor changes have been made to improve  
reproduction quality.

Points of view or opinions stated in this docu-  
ment do not necessarily represent official  
OERI position or policy.

## INTRODUCTION

At the University of Iowa, teams of female students in the engineering, sciences, and mathematics fields are taking their learning beyond the classroom and teaching their disciplines with new techniques to elementary and secondary school children in extracurricular settings. These college students are participating in *Service Learning Projects*, developed by the University of Iowa's Women in Science and Engineering (WISE) Program and sponsored by a grant from the Iowa Science Foundation.

**What Is Service Learning?**

Service learning refers to a form of experiential education that emphasizes for students the importance of accomplishing tasks that meet the needs of others. The National and Community Service Act of 1990 defines service learning with four criteria:

- (a) students learn and develop through active participation in thoughtfully organized service opportunities that meet actual community needs;
- (b) the service is related to the student's academic curriculum, and students have time to think, talk, or write about the service activity;
- (c) students acquire and use new skills and knowledge in real-life situations;
- (d) the service activity extends student learning beyond the classroom and helps foster a sense of caring for others.<sup>1</sup>

In our *Service Learning Projects*, the community need is for extracurricular science education for elementary and secondary school children. Extracurricular settings may include science clubs, other youth clubs, after-school programs, and Girl Scout groups. As for the students, college undergraduates and graduates are organized by similar academic interests in teams of four to six members. Each team is advised by a staff or faculty member from the University, or by an off-campus professional. These mentors and their teams of college students develop hands-on science activities related to their

own academic curriculum. Activities are chosen that use gender-free language, require hands-on experience, relate the exercise to daily life, are non-competitive, and support more than one correct outcome. By working in teams, students think, talk, and document their projects in the form of curriculum packets, consequently improving their verbal and written communication skills as well as their knowledge in the academic area. Their presentation skills are also enhanced as they deliver their projects to children in various extracurricular settings.

### **Who are the Mentors and Mentees?**

*Service Learning Projects* benefit two groups of mentors and mentees. The first group of mentors and mentees are the college students and the elementary/secondary school children, respectively. The college students serve as role models to the elementary and secondary school children as they deliver fun, hands-on science activities. The second group of mentors and mentees are the team advisors and the college students, respectively. The team advisors serve as mentors to the college students as they develop and deliver hands-on science activities together. These mentoring relationships are likely to continue long after the teams have completed their *Service Learning Projects*.

## **OBJECTIVES OF SERVICE LEARNING PROJECTS**

The purpose of *Service Learning Projects* is to design, implement, evaluate, and disseminate a model program for helping educators in extracurricular settings present science activities that will interest and challenge elementary and secondary school girls while helping female undergraduate and graduate students improve their scientific expertise and develop professional communication and presentation skills. *Service Learning Projects* address three main objectives:

- 1) To develop a university-based service learning program for female undergraduate and graduate students in science, engineering, and mathematics disciplines;
- 2) To design three gender-equitable science curriculum packets for use with elementary school girls (and boys) in extracurricular settings (Rocks and Fossils for grades K-1, Structures/Engineering for grades 2-3, and Genetics for grades 4-6);
- 3) To deliver and evaluate all components of each curriculum packet in extracurricular settings in Iowa City and surrounding school districts.

### **Whom do Service Learning Projects Benefit?**

On an individual basis, *Service Learning Projects* will benefit elementary school children, female college students selected for the program, and the female team advisors. On a public basis, *Service Learning Projects* will increase the awareness of gender issues in science, engineering, and mathematics; promote gender-equitable teaching in science at all levels; place science education in the context of the community; extend the scientific and technical resources of the university into the community; and increase the visibility of female scientists and engineers. Dissemination of this model program to other sites will further increase its public impact.

In addition, science and engineering groups from other institutions may benefit from *Service Learning Projects* by incorporating this model into their own outreach programs. By using *Service Learning Projects* as a model, existing outreach programs may be strengthened by adding a gender-equitable training element and by establishing strong relationships with extracurricular groups such as science clubs and other youth programs. Institutions will also be more likely to acknowledge science and engineering groups who implement outreach programs that benefit both the college students and the school children they influence. Combining service learning and mentoring accomplishes just that.

### **TEAM ROCKS AND FOSSILS!**

Four students, one teaching associate, and one faculty advisor comprised the first Team Rocks and Fossils! and were successful in developing hands-on science activities and a curriculum packet about rocks and fossils for children in grades K-1. Highlights include a homemade fossil hunt sandbox, a list of the better fossil and geode collecting areas in Iowa, a recommended book list for children, and several coloring activities.

### **TEAM STRUCTURES!**

Two students and one doctoral candidate advisor comprised the first Team Structures! and were also successful in developing hands-on science activities about structures and engineering for children in grades 2-3. Highlights include a story about an artist who made a mosaic picture out of tiles for a king. Today's version of the artist's creation uses seven geometric shapes that can be arranged in endless combinations to make different animal, boat, and other shapes. Team Structures! uses this activity to discuss how engineers use simple structures to build bridges, homes, and other buildings.

## **TEAM GENETICS!**

Three students and one scientist advisor comprised the first Team Genetics! and were also successful in developing hands-on science activities and a curriculum packet about genetics for children in grades 4-6. Highlights include making fingerprints, understanding the transfer of genes down generations using jelly beans, understanding what happens when genes “jump” between chromosomes using water color paints, and creating a “monster creature” using pictures of different body parts and the concepts of dominant and recessive genes.

## **IMPROVEMENTS IN RECRUITMENT AND RETENTION OF WOMEN**

By combining service learning and mentoring in a new approach to K-12 outreach programs, *Service Learning Projects* expect to positively influence the recruitment and retention of women in engineering, science, and mathematics fields, both at the pre-college and college levels. Although the program is currently in its first year of implementation at the University of Iowa, two out of the three teams have already delivered their projects to local after-school science programs with grand success. The Women in Science and Engineering Program is currently committed to organizing additional sites for each of the teams to visit, as well as to disseminating the completed curriculum packets to other institutions.

## **REFERENCES**

Cohen, J. and Kinsey, D.K., “Doing good and scholarship: A service-learning study”, Journalism Educator, Winter, 1994.



U.S. Department of Education  
Office of Educational Research and Improvement (OERI)  
Educational Resources Information Center (ERIC)



**REPRODUCTION RELEASE**  
(Specific Document)

**I. DOCUMENT IDENTIFICATION:**

Title: COMBINING MENTORING AND SERVICE LEARNING - A NEW APPROACH	
Author(s): JENNIFER OCIF, BEVERLY MARSHALL-GOODSELL, Ph.D.	
Corporate Source: WOMEN IN ENGINEERING PROGRAM ADVOCATES NETWORK, 1996 NATIONAL CONFERENCE	Publication Date: JUNE 1996

**II. REPRODUCTION RELEASE:**

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic/optical media, and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following two options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

The sample sticker shown below will be affixed to all Level 2 documents



Check here  
**For Level 1 Release:**  
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical) and paper copy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

\_\_\_\_\_ Sample \_\_\_\_\_

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1



Check here  
**For Level 2 Release:**  
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical), but not in paper copy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

\_\_\_\_\_ Sample \_\_\_\_\_

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at Level 1.

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries."

Sign here → please

Signature: Jennifer Ocif	Printed Name/Position/Title: JENNIFER OCIF GRADUATE ASSISTANT
Organization/Address: WOMEN IN SCIENCE AND ENGINEERING PROGRAM 232 JESSUP HALL UNIVERSITY OF IOWA IOWA CITY IA 52242	Telephone: (319) 353-2290 FAX: 319-335-3560
	E-Mail Address: wise@uiowa.edu Date: Sept. 7, 1996



## ***Share Your Ideas With Colleagues Around the World***

***Submit your publications to the world's largest education-related database,  
and let ERIC work for you.***

The Educational Resources Information Center (ERIC) is an international resource funded by the U.S. Department of Education. The ERIC database contains over 820,000 records of conference papers, journal articles, books, reports and non-print materials of interest to educators at all levels. Your publications can be among those indexed and described in the database.

### ***Why submit materials to ERIC?***

- **Visibility.** Items included in the ERIC database are announced to educators around the world through over 2,000 organizations receiving the abstract journal *Resources in Education (RIE)*; through access to ERIC on CD-ROM at most academic libraries and many local libraries; and through online searches of the database via the Internet or through commercial vendors.
- **Dissemination.** If a reproduction release is provided to the ERIC system, documents included in the database are reproduced on microfiche and distributed to over 900 information centers worldwide. This allows users to review materials on microfiche readers before purchasing paper copies or originals.
- **Retrievability.** This is probably the most important service ERIC can provide to authors in education. The bibliographic descriptions developed by the ERIC system are retrievable by electronic searching of the database. Thousands of users worldwide regularly search the ERIC database to find materials specifically suitable to a particular research agenda, topic, grade level, curriculum, or educational setting. Users who find materials by searching the ERIC database have particular needs and will likely consider obtaining and using items described in the output obtained from a structured search of the database.
- **Always "In Print".** ERIC maintains a master microfiche from which copies can be made on an "on-demand" basis. This means that documents archived by the ERIC system are constantly available and never go "out of print". Persons requesting material from the original source can always be referred to ERIC, relieving the original producer of an ongoing distribution burden when the stocks of printed copies are exhausted.

### ***So, how do I submit materials?***

- Complete and submit the enclosed *Reproduction Release* form. You have three options when completing this form: If you wish to allow ERIC to make microfiche and paper copies of print materials, check the box on the left side of the page and provide the signature and contact information requested. If you want ERIC to provide only microfiche copies of print materials, check the box on the right side of the page and provide the requested signature and contact information. If you are submitting non-print items or wish ERIC to only describe and announce your materials, without providing reproductions of any type, complete the back page of the form.
- Submit the completed release along with two copies of the document being submitted. There must be a separate release form for each item submitted. Mail all materials to the attention of Niqui Beckrum at the address indicated.

### ***For further information, contact...***

Niqui Beckrum  
Database Coordinator  
ERIC/CSMEE  
1929 Kenny Road  
Columbus, OH 43210-1080

1-800-276-0462  
(614) 292-6717  
(614) 292-0263 (Fax)  
beckrum.1@osu.edu (e-mail)