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Attracting Students and Professionals into Math, Science, and Technology Education at the Elementary and Middle Grades

Annual Report
September 1, 1992 - August 31, 1993

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The following are the program objectives for the project. The objectives achieved during the period of this annual report are set in **boldface**:

Program Objectives

- **Develop a model laboratory/classroom for teacher education at the WSU-TC campus.**
- **Provide financial incentives for students with technical majors to complete the MIT program.**
- **Emphasize issues of equity and minority participation in mathematics, science and technology education through recruitment procedures and in MIT course content.**
- Establish a program of mentoring between scientists, engineers, and mathematicians from PNL and prospective teachers in the MIT program at WSU-TC.
- Establish a program of mentoring between master teachers in area schools and prospective teachers in the MIT program at WSU-TC.
- Document activities and procedures for the purposes of evaluation and dissemination of descriptive information.
- Generate case studies of the MIT students going through this program to provide research and evaluation data on the process of attracting technically qualified people into elementary and middle school teaching.
- Create MIT program mechanisms to use the math/science mentoring teams as a means of strengthening the overall competence of MIT students in math and science.

- **Develop a model laboratory/classroom for teacher education at the WSU-TC campus.**

The "model laboratory classroom" was established with joint funding between Washington State University Tri-Cities and the Pacific Northwest Laboratory (see Attachment 1). The classroom was created from half of the space vacated by the campus library when it moved to a new location. All math and science education classes were held in this new facility.

- **Provide financial incentives for students with technical majors to complete the MIT program.**
- **Emphasize issues of equity and minority participation in mathematics, science and technology education through recruitment procedures and in MIT course content.**

Students were recruited from those applying to the Master in Teaching Program for the fall of 1993. Twelve students who applied were considered qualified for support under this grant (see Attachment 2). Students were rated according to academic and work experience background and minority status. The ratings are shown in the right hand column of Attachment 2. The bottom student on the list was very well qualified but she withdrew her application for personal reasons. Three of the students accepted for support from this grant were women and one of males was Asian.

ATTACHMENT 1

Demonstration Classroom

WSU	
Room Remodeling	$55,000
Classroom Instructional Equipment	$1000
Classroom Supplies	$1000
Instructional Computing	$5,000
DOE	
Exemplary Curriculum	$1000
Laser Video & CD-ROM Curriculum	$6,000
Exemplary Manipulatives	$2400
Microcomputer-Based Laboratory	$890

ATTACHMENT 2

rate	Birth Yr.	Major	Institution	Year	GPA	GRE Verb	GRE Quant	GRE Analy
A	1956	GS Biology	WSU TC	1993	3.91	580	680	720
A	1966	Chemistry	Albion Coll.	1988	3.40	400	560	560
A	1961	Mathematics	Ohio State U.	1985	2.35	390	620	590
A	1958	Ag. Bus.	Mont. State U.	1980	2.95	400	570	430
A	1949	GS English	WSU TC	1993	3.45	660	640	680
B	1950	Fine Arts	U. of Tex. Arl.	1974	3.51	460	490	450
B	1955	Economics	NC State U.	1977	2.88	380	410	390
C	1968	GS Soc. Sci.	WSU TC	1993	3.69	390	600	600
D	1952	GS ??	WSU TC	1993	3.64	580	590	600
D	1955	English	U. of Minn.	1980	2.71	460	490	540
D	1951	GS Psych.	WSU TC	1993	3.29	480	400	450
W	1954	Microbiology	OR State U.	1976	3.78	660	610	640

rate	Semester Hours Math	Science	Job & Other academic experience
A	7	33	Student; Research assist. PNL
A	6	31	Cum Laude; PNL Chemist
A	76	80	Owns gymnastics gym
A	15	19	Vet. assist., Farming, Qtr. Horse, Loan officer, Med. benefits
A	12	12	Phi Beta Kappa WSU; USMC technician, various tech. jobs
B	13	18	Biol. Minor; Biol. & Math at CBC
B	18	9	Bank bookkeeper
C	5	20	Alpha Comp. Ctr.
D	5	28	School volunteering
D	15	3	Construction; Candy making business
D		15	Early Childhood instr. CBC
W	8	MS '83	MS Radiation Bio., OSU; technician & radiological engineer

The following are the program objectives for the project. The objectives achieved during the period August 31, 1993 and February 28, 1994 are set in **boldface**:

Program Objectives

- Develop a model laboratory/classroom for teacher education at the WSU-TC campus.
- Provide financial incentives for students with technical majors to complete the MIT program.
- Emphasize issues of equity and minority participation in mathematics, science and technology education through recruitment procedures and in MIT course content.
- **Document activities and procedures for the purposes of evaluation and dissemination of descriptive information.**
- **Generate case studies of the MIT students going through this program to provide research and evaluation data on the process of attracting technically qualified people into elementary and middle school teaching.**
- **Establish a program of mentoring between scientists, engineers, and mathematicians from PNL and prospective teachers in the MIT program at WSU-TC.**
- **Establish a program of mentoring between master teachers in area schools and prospective teachers in the MIT program at WSU-TC.**
- Create MIT program mechanisms to use the math/science mentoring teams as a means of strengthening the overall competence of MIT students in math and science.

- **Document activities and procedures for the purposes of evaluation and dissemination of descriptive information.**
- **Generate case studies of the MIT students going through this program to provide research and evaluation data on the process of attracting technically qualified people into elementary and middle school teaching.**

Students selected for the program are listed in Attachment 1. They each went threw an entry interview which are summarized in Attachment 2. This protocol will be conducted again at the end of their MIT program at WSU Tri-Cities. Additional information is still being gathered from mentor teachers and WSU student teacher supervisors on the progress of these

students in various components of the teacher preparation program. The overall Evaluation Plan is shown in Attachment 3. This plan was not completed within the funding period of this grant.

- **Establish a program of mentoring between master teachers in area schools and prospective teachers in the MIT program at WSU-TC.**

Each student was assigned to two different mentor teachers. In each case at least one of them was an exemplary teacher in the area of math and/or science. Placements were made also to maximize exposure to culturally diverse classrooms with student populations at least 50% from minority cultures.

- **Establish a program of mentoring between scientists, engineers, and mathematicians from PNL and prospective teachers in the MIT program at WSU-TC.**

Students C, D, and E were given summer appointments at PNL. Student A was already working as a research assistant at PNL as part of her ongoing graduate program in biology. Student B was a previous employee of PNL and in conjunction with her new baby elected not to take a summer appointment.

- Create MIT program mechanisms to use the math/science mentoring teams as a means of strengthening the overall competence of MIT students in math and science.

This objective was not met. Improved organization during a second year of this project could result in increasing the impact of the math and science backgrounds of these students on the MIT program. Unfortunately, funding from DOE for these types of programs was terminated after one year.

ATTACHMENT 1

Washington State University Tri-Cities
Attracting Students and Professionals into Math, Science,
and Technology Education at the Elementary and Middle Grades
(partially supported by Department of Energy Grant: DE-FG06-92ER75776)

Supported Students for 1993-94
each receiving $1779.00, .5 academic year tuition as stipend

Name	Birth	Undgergrad. Major	Institution	Year	GPA	GRE Verb	GRE Quant	GRE Analy
A	1956	GS Biology	WSU TC	1993	3.91	580	680	720
B	1966	Chemistry	Albion College	1988	3.4	400	560	560
C	1961	Mathematics	Ohio State U.	1985	2.35	390	620	590
D	1958	Ag.. Business	Mont. State U.	1980	2.95	400	570	430
E	1949	GS English	WSU TC	1993	3.45	660	640	680

Name	Credits in: Math	Science	Job & Other academic experience
A	7	33	Research assistant with Dr. Brooks at PNL
B	6	31	Cum Laude; PNL Chemist
C	76	80	Owns gymnastics gym
D	15	19	Vet. assist., Farm, Qtr. Horse, Med. benefit
E	12	12	Phi Beta Kappa; USMC electronics, avionics, radar

ATTACHMENT 2

Summary of Entry Interviews
Oct. 29, 1993

1. What are your teaching interests and goals?

High School	3	initially but changing mind
Middle School	3	
Intermediate	3	
Primary	1	

2. What factors played a role in choosing career move?

	Positive (move toward)	Negative (move away from)
Instructional experience	5	
Parents/friends	4	
Current job	1	2
Previous teachers		1

3. What relationship do you see between your background and teaching?

	Positive Influence	Negative Influence
Skills & Knowledge	4	
Different perspective	2	1
World of work	1	
Uncertain	1	

4. What would best promote your ability to use m/s background in teaching?

Teacher mentor	5
MIT program	3
Informal observation	2
PNL assignment	2
Access to ed. materials	1

ATTACHMENT 3

EVALUATION PLAN

Entry Interview
What are their initial teaching interests and goals?
What part did DOE program play in choosing career move now?
What relationship do they see between their background and teaching?
What would best promote their ability to use m/s background in teaching?

1st Year Experiences in MIT Program
What is their performance in courses?
What is the effect of their background to other MIT students?
What is their overall attitude toward teaching?

1st Year Experiences with Teacher Mentor
Describe mentoring context: building, facilities, and Mentor qualifications
Document the amount of time spent with Mentor.
What is the Mentor's evaluation of student?
What is student's evaluation of Mentor and experience?
What was accomplished during this experience?

Battelle Appointment
Describe professional science context.
What is the Scientist's evaluation of student?
What is student's evaluation of Scientist and experience?
What was accomplished during this experience?

2nd Year Practicum Experiences
Pre-Internship evaluation of student.
Student Teaching evaluations of student
Document role of math and science in these experiences.

Exit interview
What are their teaching interests and goals?
What part did DOE program play in furthering their career goals?
What relationship do they see between their background and teaching?
What would best promote their ability to use m/s background in teaching?

1st Year Job Placement
Describe 1st year jobs.
Describe reasons for those who are not placed.