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ABSTRACT

A formative evaluation of a University of Tennessee, Knoxville, predoctoral project was conducted. The program, which was funded by the federal Minorities and Women's Program, was designed to increase the participation of minorities and women in educational research and development. The project, "Experimental Program for Opportunities in Advanced Study and Research in Education," involved 18 minority and female second-year doctoral students, 19 faculty members, and 8 individuals holding doctorates and employed in local education agencies or other organizations. Students who received fellowship support believed that the project experience had been most effective in increasing their abilities to engage in an internship, work with a mentor, strengthen network ties, and write a research report. According to participants, other factors that distinguished this program from a typical doctoral program included interdisciplinary contact, support for research services and travel, and exposure to a range of issues of interest to minorities and women. A majority of participants believed the project experiences enhanced the employability of students. Several measures indicated that both the production and utilization of research increased as a result of the project. (SW)

NATIONAL INSTITUTE OF EDUCATION PROJECT FOR PRE-DOCTORAL FELLOWS AT THE UNIVERSITY OF TENNESSEE, KNOXVILLE

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National Institute of Education Project
for Pre-Doctoral Fellows at the
University of Tennessee, Knoxville

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Background

The Minorities and Women's Program of the National Institute of Education was established in 1977 in response to a resolution of the policy-making body for the NIE, the National Council of Educational Research, which declared that:

> "It shall be the policy of the National Institute of Education to increase the participation of minority persons and women in research and development efforts of the nation through ensuring that qualified minority firms and individuals and qualified women are given informed opportunity to participate in NIE programs, and through efforts to increase the numbers, qualifications and performance of minority firms and individuals, and women engaged in R&D (Baker, 1979, p.3)."

The principal objective of the Minorities and Women's Program has been to increase the quality and relevance of educational research and development by seeking ways to a) assist minority and women scholars to participate at advanced levels of educational research and related work, and b) overcome barriers to recognition of research contributions, perspectives, and interests of minority persons and women (Baker, 1979, p.9).

This objective is predicated on the well-documented conclusion that the social context of education is adversely affected by the underrepresentation of minorities and women in educational research and development.

Forbes has observed that

> "Most ERD (educational research and development) work then has been carried out by people who are, by definition, not involved in the world dealt with by the research . . . Thus we discover not only ethnic bias and elitism but also the difference between a theoretical problem conceived by a "detached" researcher . . . and a problem arising in the actual process of education and brought to the level of R and D by actual practitioners or target groups . . . the White theoretician R and D specialist discovers "a problem" which is not the same "problem" seen by a non-White practitioner or consumer (1977, p.4)."

According to Martin, "when the activities and experiences of females are excluded from the educational realm, those of males provide our norms (1982, p.147)."

Baker has added that

"R&D agendas and methodologies by-pass or are ill-suited to address the stubborn problems plaguing urban and rural schools attended by poor children and by minority children. Then too, staffing patterns in educational research and educational institutions undermine the relevance, focus, and credibility of improvement efforts, since they are led by persons from outside the populations intended to be served (1979, p.4)."

Finally, Bagenstos suggests that

"Having minority and women researchers in significant numbers and roles would increase the perspective brought to bear on the most difficult educational problems and thus increase the quality and the relevance of the research. Credibility would be increased because, as much research indicates, we tend to believe those who are like us - the concept of homophily is articulated in both dissemination research and in communication research more broadly. The population of researchers, then, should reflect the population of the nation so that everyone has someone to trust! (1981, p.4)"

A number of barriers to the full and equal participation of minorities and women in educational research and development have been identified, including:

1) inadequate quantitative and theoretical preparation (Sells, 1973).

2) a poor record of research publication, which in turn limits opportunities for obtaining research funding, achieving tenure, and advancing in the professional field (Gappa, 1977).

3) lack of role models and mentors (Pollard, 1977).

4) lack of financial or other support for research on matters of concern to women/minorities (Wright, 1979).

5) little or no access to formal or informal networks for information about jobs and opportunities for publication or research funding; perpetuation of the "old boy network" for communication of information (Malcolm et al., 1976).

6) limited research assistantships (Pollard, 1977).

7) limited experience, including lack of internships in the field (Artis, 1980).

Since 1978 the NIE Minority and Women's Program has funded more than 50 projects that have employed a variety of strategies to overcome these barriers, including:

1) strong training in quantitative and theoretical research methods (Morrison, 1977).

2) opportunities to apply the research methods learned in courses under the supervision of experienced research workers (Carter, 1977). This should include grant proposal writing; conduct of research and evaluation projects; and preparation of technical reports, papers for presentation, and articles for publication (Morrison, 1977).

3) opportunities to establish relationships with experienced persons who can serve as mentors (Artis, 1980).

4) research assistantships and/or fellowships and access to computer assistance, travel funds, and other forms of support for independent or cooperative research endeavors (Carter, 1977; Morrison, 1977).

5) opportunities to build a sense of a research community through informal contacts with experienced research workers at local, regional, and national workshops, seminars, and conferences (Morrison, 1977).

6) opportunities to engage in internships related to the career aspirations of the program participants (Banta, et al, 1982).

7) advanced training opportunities through workshops or formal coursework (Artis, 1980).

The models for delivery of services which have been employed in the Minorities and Women's Program include internships in government or research agencies for staff in R&D positions, fellowships in a university setting, R&D seminars and workshops, collaborative capacity building involving a major research university and a developing institution, and university-sponsored forums and publications designed to disseminate information on issues of interest to minorities and women.

One of the university-based programs was carried out at the University of Tennessee, Knoxville. In the sections which follow, that program will be described and its accomplishments evaluated.

Program at the University of Tennessee, Knoxville

In May 1979 a three-year NIE project entitled "Experimental Program for Opportunities in Advanced Study and Research in Education" was initiated at the University of Tennessee, Knoxville (UTK). The program provided fellowship support and a variety of enrichment experiences for 18 (six each year) minority and female second-year doctoral students. It was designed to assist program participants in gaining entrance to the "most qualified" applicant pool for positions in educational research and development.

Doctoral students in the UTK fellowship program received thorough training in quantitative and theoretical research methods in their regular coursework and in specialized mini-courses provided for them by faculty members with expertise in areas not covered in scheduled courses.

To supply enrichment experiences for the doctoral students, or Student Associates (SAs), a network was formed of UTK faculty members and "Field Associates," individuals holding the doctorate and employed

in local education agencies or other social service organizations. Both Faculty and Field Associates provided the settings and the necessary guidance to permit SAs to apply principles learned in coursework in proposal writing, project design and data collection in research and evaluation studies, analysis and interpretation of data, technical report writing, and preparation of conference papers and articles for publication.

Interaction of project personnel was promoted through structured exercises in group dynamics and informal gatherings in settings outside the University. Students traveled with Faculty and Field Associates to several professional meetings each year. Through these interactions as well as the various research groups which were formed, a number of mentor relationships were fostered, and a network of project associates was formed.

In addition to fellowship funds the NIE grant made possible the provision of several types of assistance that promoted the involvement of project associates in educational research and development work, including clerical assistance for the typing and editing of manuscripts, computer services for the analysis of data, and funds for travel to conferences and workshops where papers were presented and/or specialized training was pursued.

Through contacts supplied by Faculty and Field Associates each of the SAs was afforded the opportunity to participate in one or more internships that provided experiences related to her/his career goals. Settings for internships ranged from the offices of the Dean for Research and the Executive Vice-President of the University of Tennessee to an evaluation consulting firm in Massachusetts and the personnel benefits office of IBM in Armonk, New York.

Throughout the project the SAs gained hands-on experience in management and evaluation of a complex project by operating the NIE-sponsored program themselves with guidance from the project director. The positions of Chair, Scribe, and Budget Monitor were rotated quarterly so that each SA gained experience in program planning and organization, budgeting, technical report writing (preparing quarterly and annual project reports for NIE), and program evaluation.

Over three years a total of 45 individuals participated in the project, including 18 Student Associates, 8 Field Associates, and 19 Faculty Associates. Of this total 38, or 84 percent, were minorities and/or females. All of the SAs and Field Associates were minorities and/or females. Twelve of 19, or 63 percent, of the Faculty Associates were females; four, or 21 percent, were black females.

Evaluation of the UTK Program

Design and Instrumentation

Bagenstos has identified a critical problem in providing summative evaluation of the projects sponsored by the NIE Minorities and Women's Program:

> The most difficult part of designing the evaluation has been determining appropriate outcome measures-dependent variables. Because the real outcomes - success for individual participants, removal of institutional barriers, change in the nature of the research agenda - are so long term, the need was to find "proxy" measures. (1981, p.8).

Bagenstos has suggested that until long-term achievements can be assessed, formative evaluation can be undertaken by looking at details of project implementation and how those were perceived by participants; and summative evaluation can be initiated by investigating research productivity of participants, positions obtained by persons completing the project and time and energy which they devote to research, and immediate impact on the institution where the project was conducted.

As noted earlier, the UTK fellowship students designed and carried out their own program evaluation for each of the three project years. Of necessity most of the techniques employed provided formative data, and emphasis was placed on individual development and self-assessment.

Immediately following the end of the final year, the project director and two Student Associates developed a series of survey instruments to obtain additional evaluative information from all project participants. At that point 9 of the 18 students who had received fellowship support during the three years of the project had completed their degree programs, while 9 were continuing their studies.

Two questionnaires containing a core of similar items as well as questions tailored for each audience were designed for (1) Student Associates and (2) Faculty and Field Associates. When Student Associates' questionnaires had been returned and analyzed, a second survey instrument for the students was developed and administered in order to gain additional insights into certain responses provided on the first instrument. The first questionnaire for SAs was returned by all 18 of the fellowship recipients, the second by 17 of 18. The survey for Faculty and Field Associates was sent to 19 individuals who had been associated with the project for all three years and was returned by 13, or 70 percent. The findings summarized below are based on the combined responses to all three questionnaires.

Results of Formative Evaluation

Participation and perceived value of project experiences. All project participants were asked to assess in a number of ways the set of experiences made available to SAs as part of the NIE-supported program. Table 1 contains a summary of SAs' ratings of the experiences in terms of (1) the extent of their own participation (scale: 1=Not at all, 5=Very Extensively) and (2) the perceived value to them (5=Excellent Value). Participation in all but two of the activities was moderate to extensive, and in general there was a close correspondence between level of participation and perceived value of the experiences. All experiences were viewed as having been at least of moderate value, and most were considered of good to excellent value.

SAs considered the following six experiences to have been of most value:

1. Engaging in an internship
2. Travel to present at professional meetings
3. Travel to obtain training
4. Developing a written report of research
5. Effectively managing time
6. Presenting research results orally

TABLE 1

Student Associates' Responses to Value and Extent of Participation in Project Activities

Median Extent of Participation	Median Value of Experience	Activity
3.5	5	Engaging in an internship
3	5	Travel to present at professional meeting
2	5	Travel to obtain training
4	4.5	Developing a written report of research
4	4.5	Effectively managing time
3	4.5	Presenting research results orally
4	4	Increasing understanding of issues re: women/minorities
4	4	Developing interpersonal skills
3.5	4	Working with a mentor through NIE
3	4	Defining a research topic
3	4	Studying research design/methodology
3	4	Developing research design
3	4	Developing methodology for data collection
3	4	Developing management skills through project management
3	4	Increasing/strengthening professional networks
3	4	Designing/carrying out program evaluation
3	4	Using automated data processing methods
3	4	Developing a grant proposal
3	4	Developing leadership skills
3	3.5	Selecting/developing method of analyzing data
2	3	Developing/monitoring a budget for a research project
2	3	Developing skills as a professional consultant

Faculty and Field Associates also perceived experiences 1, 2, and 6 above to have been of most value to the SAs, but in place of experiences 3, 4, and 5 the experienced professionals placed the following three experiences in their list of the six most valued activities:

.Participating in a relationship with a mentor associated with the project

.Developing interpersonal skills

.Developing an appropriate research design

SAs, Faculty, and Field Associates agreed that developing skills as a professional consultant and developing/monitoring a budget for a research project were not experiences that had been as significant for SAs as most others.

The item "travel to obtain training" presented the largest discrepancy between extent of students' participation in an activity and its perceived value. Apparently, even though there were only a few opportunities to attend training workshops and conferences located outside Knoxville, SAs considered those to have been of great value.

When presented with an unstructured opportunity (i.e., an open-ended question on the survey instrument) to identify the project activities they "valued most," SAs provided a perspective that differed only slightly from that conveyed through responses based on the structured listings. As the content of Table 2 conveys, the most valued opportunity was that of applying one's research skills in projects conducted cooperatively with others, especially with individuals outside one's own discipline. Opportunities to travel to attend professional meetings and/or present papers, and to become part of a professional network also were considered important benefits.

Field and Faculty Associates also identified opportunities for professional travel, application of research skills in interdisciplinary settings, and network-building as the outstanding positive features of the NIE project.

When Faculty and Field Associates were asked, "What project activities were of most value to you?" the following experiences were listed with equal frequency:

.the privilege of having the assistance of doctoral students and computer and clerical support as they pursued their own research.

.the opportunity to obtain funding for travel to present papers at professional meetings.

.the chance to engage in cooperative, interdisciplinary research.

Skill levels and perceived relationship to the project. Skills and abilities related to the project experiences just described were listed, and SAs were asked to (1) assess their own level of expertise with respect to each, and (2) estimate the extent to which that level of expertise was related to experiences provided by the project. Level of expertise was to be judged by comparing oneself with fellow doctoral students or professional colleagues with the same level of experience. SAs rated level

TABLE 2

Activities Identified as "Most Valued" by Student Associates

% of Respondents Listing Response	Response
56	Opportunity to participate in research projects at varying stages of development with people outside one's own department
28	Travel to attend and/or present at professional meetings
17	Becoming part of professional networks
17	Opportunity to meet and work with graduate students from other colleges and/or disciplines
11	Colloquia and workshops
11	Internships
11	Increased awareness of women's/minority issues
11	Chance to work with/learn from mentors
6	The variety of experiences available
6	Project management

of expertise on a 5-point scale with 1=poor or nonexistent and 5=outstanding; relationship of skill level to project experience was rated on a 5-point scale with 1=not at all related and 5=completely related. Students' median responses are summarized in Table 3.

The range of median responses on both scales is quite narrow: The perceived level of expertise on every skill was rated 3(average) or 4 (above average), and perceived relationship to project participation was 3 (moderately related) or 4 (highly related) for all but three of the skills. These response levels seem to indicate that SAs considered their skill levels with respect to 19 project-related activities to be relatively high and attributed to the NIE project a moderate to high proportion of the experience that had led to the development of those levels of expertise.

With respect to the five skills/abilities listed below SAs considered their level of expertise to be above average (median rating of 4) and the relationship of that expertise to the project experience to be high (median rating of 4).

1. Ability to engage effectively in an internship.

2. Ability to develop a written report of research results.

3. Ability to work effectively with a mentor.

4. Skill in increasing/strengthening professional network ties.

5. Increasing understanding of issues related to women and minorities.

Apparently SAs attributed the development of their skills in using automated data processing, defining a research topic, and performing the role of professional consultant more to experiences gained in connection with their academic programs than to experiences provided by the NIE-supported program.

Value of experiences and their relationship to the project. Combining responses concerning (1) the value of project experiences and (2) the relationship to the NIE project of the development of skills connected with these experiences produces a list of activities that were both highly valued (median rating of 4-5) and seemed to involve skills that were promoted strongly (median rating of 4) by the NIE program. Apparently the following four experiences were for students the most valued benefits of the project when it was compared to experiences provided in the traditional doctoral program:

1. Engaging in an internship.

2. Developing a written report of research.

3. Increasing and strengthening professional networks.

4. Increasing understanding of issues relating to women and minorities.

When the response format was not specified, and SAs had the opportunity to construct their own list of experiences that differentiated the NIE project experience from that of the typical doctoral program, a somewhat

TABLE 3

Level of SA Expertise and
Relation of That Level to the Project Experience

Median Response to Level of Expertise	Median Response to Relationship to NIE Experience	Skill/Ability
4	4	Ability to engage effectively in an internship
4	4	Ability to develop a written report of research results
4	4	Skill in increasing/strengthening professional network ties
4	4	Increased understanding of issues re: women/ minorities
4	4	Ability to work effectively with a mentor
4	3	Ability to effectively manage time
4	3	Skill in presenting research results at professional meetings
3.5	3.5	Skill in presenting research results orally
3	3.5	Skill in designing/carrying out program evaluation
3	3	Skill in research design/methodology
3	3	Skill in developing appropriate research designs
3	3	Skill in developing appropriate data collection techniques
3	3	Skill in managing a project such as NIE
3	3	Skill in developing a -rant proposal
3	3	Ability to select appropriate methods of data analysis
3	3	Ability to develop/monitor a project budget
3	2.5	Skill in defining a research topic
3	2.5	Ability to perform the role of professional consultant
3	2	Skill in using automated data processing

different perspective emerged. As the content of Table 4 indicates, students were most favorably impressed with their opportunities to apply a variety of research skills to a variety of research problems in settings where their contributions were valued by established professionals. Professional travel, internships, and mentor relationships also distinguished the project experience from that of the doctoral program.

Faculty and Field Associates also were given an opportunity to construct their own responses to the question of differential experiences provided by the NIE project. These individuals most frequently identified opportunities for students to (1) obtain financial support for travel and other research-related activities, and (2) establish professional and personal relationships with established professionals in addition to those established with members of the doctoral committee.

All participants were asked to identify those project experiences which were of least value to them. This item produced few responses and no clear trends. Four of the 18 SAs said their internship experiences had not met all the expectations they had established for them. Three students mentioned individual colloquium topics that had not appealed to them. Two students said project social activities had been the least valuable aspect of the project. No two Faculty/Field Associates mentioned the same activity as being least valuable.

The mentor relationship. On the second questionnaire for SAs, which was designed to provide more detailed information than the first concerning certain aspects of the project, the students were asked to describe their perceptions of a mentor. These perceptions seemed to cluster in three categories:

(1) The "interested party" role model who does not participate actively in decision-making (10 respondents);

(2) The "experienced comrade" who gives advice and takes a relatively active role in guiding the novice (4 respondents); and

(3) The "instrumental" mentor who acts as a ground-breaker, opens doors, and actively gives career guidance (3 respondents).

Twelve, or two-thirds, of the SAs said that they had had a mentor as a result of their involvement in the NIE project. Eight of thirteen, or 62 percent, of the Field and Faculty Associates said they had served as mentor for one or more SAs during the course of the project.

All SAs who had experienced a relationship with a mentor considered that experience "extremely" or "somewhat" positive (rating of 5 or 4 on a 5-point scale). When asked how the NIE experience had enhanced their opportunity for a mentor experience, 37% responded that the project structure encouraged such relationships, 22% said it facilitated such relationships with persons outside their base departments, and 11% said it provided an opportunity for skill development. Responses are summarized in Table 5.

Benefits which SAs identified with mentor relationships (see Table 6) paralleled their definitions of mentors, i.e., mentors were seen as sources of technical knowledge and professional as well as personal support. Faculty and Field Associates responding to a similar item said "a mentor can open doors and provide professional contacts and opportunities" and "the student can benefit from the mentor's past mistakes."

TABLE 4

Activities Differentiating the NIE Experience from a Typical Doctoral Program

% of SAs Giving Response	Response
50	Chance to work on many different research tasks and projects as a valued contributor
44	Chance to work with faculty and students from many different departments and colleges
44	Chance to travel to and/or present at professional meetings
19	Chance to intern in self-selected settings with Project support
19	Chance to work with mentors outside one's own department
11	Chance to participate/present in colloquia and mini-courses
11	Chance to learn more about women's/minority issues
6	Chance to participate in workshops
6	Help in establishing/expanding a professional network
6	Access to specialized consultants

TABLE 5

Student Associates' Perceptions of
Ways in Which the NIE Experience Enhanced Mentor Relationships

%	Response
37	Project structure encouraged such relationships
22	Encouraged such relationships with persons outside one's own base department
11	Provided opportunity for skill development
6	Internships developed into mentor relationships
6	Helped SAs learn how to find a mentor
6	Helped SAs learn how to be a mentor
6	Provided role models

TABLE 6

Student Associates' Perceptions of Benefits
Associated with a Mentor Relationship

% response	Response
44	Mentor is a source of knowledge
44	Mentor is a source of technical support
27	Mentor can enhance networking opportunities
16	Mentor is a source of emotional support
6	Mentor can provide a role model
6	Mentor can aid in job placement
6	Mentor can provide research opportunities

Networking. SAs were asked to provide their own definition of a professional network. Most respondents viewed networks as sources of information. Others considered them to be more actively facilitative, i.e., sources of job or research opportunities, as in an "old boy network." About half of the respondents thought that project participation had allowed them to develop new network ties, whereas about one-third thought that NIE participation had helped strengthen existing ties. The SAs said network development had been enhanced through (1) travel to professional meetings or for training, (2) relationships with other students, and (3) opportunities to work with faculty.

Group research. The opportunity to engage in research activities with others was a principal project benefit, according to students as well as Faculty and Field Associates. When asked if they had participated in group research with other project participants, 70 percent of the field/faculty respondents and 88 percent of the SAs replied affirmatively. However, approximately half of the students and 40 percent of the established professionals said they felt their productivity was greater when they worked alone than when they were part of a group.

In response to the question, "What research tasks are best accomplished in groups?" SAs most frequently mentioned, "developing papers for presentation/publication," "data collection," "data analysis," and "evaluation." Faculty and Field Associates said, "developing the design for a research project" and "evaluation."

Awareness of minorities' and women's issues. The SAs were asked to list ways in which the NIE project had enhanced their awareness of issues relating to women and minorities. Most mentioned the colloquia as important sources of information about these issues. (Colloquium topics were selected by SAs and presentations were invited from faculty and outside consultants.) Approximately half of the SAs mentioned informal group discussion as a source of information, and one-fourth mentioned workshops or conferences. Internships, research involvements, and the SAs' own research also were mentioned. Faculty and Field Associates also considered the colloquia to be important sources of information about issues of interest to minorities and women, and mentioned as another source the contacts with minorities and women who participated in the project.

SAs were asked how their increased knowledge of issues of concern to minorities and women would influence them professionally. Forty percent said they had acquired new ideas for solving related problems, and had experienced an increase in their willingness to provide support for other minorities and women. Sixteen percent noted that their own behavior had been changed, i.e., they had become more assertive, less passively accepting of inequities. Several of the students said they had become active politically or had changed career goals.

Results of Summative Evaluation

Effects of project participation on employability of Student Associates. An important objective of the NIE project at UTK was to increase the likelihood that participants would be classified in the "most qualified applicant" pool when they applied for employment. While only

seven of the SAs had obtained full-time employment (4 as faculty in higher education, 2 in industrial training) at the time the follow-up questionnaires were administered, 16 of 18, or 87% of the respondents believed project participation had significantly enhanced their employability. Sixty-two percent of the Faculty and Field Associates concurred in this assessment.

SAs were asked to describe the effects of project participation on the likelihood of their being placed in the "most qualified applicant" pool. Their responses indicated that the research experience was valued by prospective employers. In some cases the project experience itself, especially the internship, led to part- or full-time employment.

Research utilization. The real pay-off of a project such as that supported by NIE at UTK may be the degree to which participants increase their use of, or participation in, educational research. To assess how SAs were affected by the project in this sense, SAs were asked to respond to four questions:

1. How has the project influenced your ability to participate in/benefit from educational research?

2. To what extent are you currently using the results of educational research?

3. To what extent are you currently engaged in educational research?

4. What are your plans for future research involvements?

Most SAs stated that the research experience gained during the project had influenced their ability to participate in or benefit from educational research by enhancing the development of their research skills. Other comments indicated that students had achieved an increased awareness of research issues, increased ability to critically analyze disseminated research, new skills in the technical aspects of research dissemination and new skills in the solicitation of appropriate assistance ("asking the right questions"). When asked how they currently were using the results of educational research, four SAs responded that they were using results as student consumers, three as classroom instructors, and one each as a critical assessor of disseminated research, as a program evaluator, as a data collector, and in developing a model for application in industrial on-the-job training.

SAs described their current research involvements as work on a dissertation (37%), continuation of projects begun through NIE participation (37%), data collection as a part of employment (11%), writing position papers (6%), and developing industrial models (6%). Only one student stated that her involvement in research was limited or non-existent.

Projections for future involvement in educational research also were solicited. Only one respondent replied that her involvement was likely to be negligible. Two SAs were largely concerned with their dissertations. Others mentioned specific research interests in varying stages of development, including maternal satisfaction in home vs. professional settings, black children in the community, and women in management, among many others.

Research production. A project which attempts to increase the research participation of women and minorities also may be evaluated on the basis of the products -- research projects and disseminated research -- which it generates. In this regard, the NIE project at UTK was particularly successful. The data in Table 7 indicate that on the average each year of the project each of the six current SAs was involved in at least three research endeavors that resulted in a written product. The average number of paper presentations alone was three for each SA during Year 1 and Year 2, and declined only slightly in Year 3. The number of publications had increased five-fold by the end of the third year. The number of proposals developed also increased dramatically as the project became established.

Impact on barriers to recognition of research contributions by minorities and women. The NIE project on the UTK campus heightened awareness of the benefits of involving minorities and women in educational research and administration.

Several SAs were selected for special awards/recognition (see Table 8). One Faculty Associate was selected for participation in a research symposium for minorities as a direct result of the NIE project. The project director received the 1980 College of Education Faculty Research Award and a Chancellor's Citation for Extraordinary Service to the University in 1982.

The appointment of the first full-time female faculty member in one of the departments of the College of Education at UTK can be attributed directly to the effective operation of the network of project participants.

All Faculty and Field Associates responding to the end-of-project survey indicated that they considered the project to be of such value that they would want to continue to participate in similar experiences with doctoral students even without the funding for research support services which was provided by NIE.

A program incorporating the kinds of enrichment experiences which were provided for students by the NIE project was considered by the Dean for Graduate Studies and the Dean for Research to be important enough to continue. Participants were to be recipients of non-service fellowships at UTK.

TABLE 7

Research Production by Student Associates
During Each of Three Project Years

	Year 1	Year 2	Year 3
Presentations	18	18	16
Publications	2	9	10
Proposals	4	21	18

TABLE 8

Awards and Special Recognition Accorded Student Associates

Chancellor's Citation (Outstanding Graduate Student)
UTK Women of Achievement Award
2 selected to attend AERA-NIE Annual Meeting Presessions
2 Fellowships at the Appalachia Education Lab
PDK International Committee on Public Confidence in Public Education
College of Home Economics Excellence in Research Award

Summary

Participants -- Faculty, Field and Student Associates -- in the UTK pre-doctoral program for minorities and women valued all of the professional experiences afforded by the project, but seemed most appreciative of the impetus which the project gave to bringing together professionals and pre-professionals from various disciplines to (1) consider and carry out joint research endeavors, (2) form networks, and (3) establish bases for internships and mentor relationships.

Students who received fellowship support believed that the project experience had been most effective in increasing their abilities to engage in an internship, work with a mentor, strengthen network ties, and write a research report. They also felt that the experience had increased their understanding of issues of concern to minorities and women.

Opportunities afforded by NIE support which most clearly distinguished the project experience from the typical doctoral program were identified by participants as those involving interdisciplinary contacts, internships, technical writing practice, support for research services and travel, and exposure to a range of issues of interest to minorities and women.

Almost all of the students and more than 60 percent of the professional participants believed the project experience enhanced the employability of Student Associates. Several measures indicated that both the utilization and production of research by participants increased as a result of the NIE project.

Heightened awareness of the unique contributions which minorities and women can make to educational research and administration was demonstrated by the number and kinds of awards and special recognition which were accorded NIE project participants over the three years of its operation at UTK.

Conclusions

The results of formative evaluation of a three-year project carried out at the University of Tennessee, Knoxville with funding from NIE have demonstrated the effectiveness of a model for increasing the participation of minorities and women in educational research and development which includes such components as:

1) strong training in quantitative and theoretical research methods,

2) opportunities to apply research techniques under the supervision of experienced professionals,

3) opportunities to establish relationships with mentors,

4) fellowship assistance and financial support for the conduct of research and dissemination of findings,

5) opportunities to build and/or strengthen network ties through local associations and professional travel,

6) internship opportunities, and

7) advanced training in formal courses or workshops.

Although opportunities to enhance technical skills through courses offered by the University and mini-courses or colloquia conducted under project auspices were readily available to each project participant, the acquisition of quantitative and theoretical expertise was not valued as highly by UTK participants as were opportunities to apply knowledge and to increase professional contacts. Interdisciplinary research experience, networking, internships, and relationships with mentors consistently received the highest ratings when a series of measures was utilized to evaluate the effectiveness of the components of the training model.

Since the action of convening individuals with varying levels of expertise to work cooperatively on problems of common interest can be accomplished without external funding, most participants said they were willing to continue to be involved in activities associated with the project even after the NIE grant was terminated. Unfortunately, however, without the benefits provided by the external funds, e.g., financial assistance for students, released time for a faculty coordinator, reimbursement for professional travel, clerical and computer support, the impetus for continuation of such a training program must come from the energy and good will of volunteers -- not usually a very reliable source.

The visibility and perceived success of the NIE program for pre-doctoral fellows at UTK assured its continuation in some form. However, the absence of funding for coordination and support services has reduced the scope, therefore the impact, of the continuation effort.

Satisfactory summative evaluation of the UTK project must await the establishment of program graduates in their professional careers. Nevertheless, already there is some evidence that the social context of education will be influenced by increased awareness of the contributions that can be made by minorities and women associated with the NIE program. Ideally the research productivity of NIE pre-doctoral fellows would be contrasted with that of a comparison group, but the number of minority doctoral students in educational fields at UTK was so small that most were selected to participate in the program. Informal comparisons indicated, however, that the number of research projects planned, in progress, and completed by NIE fellows exceeded that of comparable numbers of their peers in traditional doctoral programs at UTK. In addition, the predominantly white male faculties of several departments in the College of Education at UTK acquired new awareness of minorities' and women's issues by serving as research group leaders and as mentors for project participants. Evidence of their increased appreciation of the capabilities of minorities and women is provided by the numbers and kinds of special awards and recognition which they accorded to the pre-doctoral fellows and some female faculty participants.

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