THE STRENGTHS AND WEAKNESSES OF THE MONTANA STEP PROGRAM AS REPORTED BY PARTICIPANTS

By

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ABSTRACT

A telephone survey was conducted of the 1994-2000 STEP NSF Teaching Scholars in order to gather demographic information and current employment on the scholars as well as to gain information about the scholars' perceptions of the STEP program structure. The survey also examined the scholars' perceptions of various supports and barriers to the successful completion of the scholars' undergraduate teaching program. The survey responses (109 out of the 127 scholars) were collected and summarized. Eighteen scholars were not contacted due to the fact that their current address and/or telephone numbers were not listed or unknown.

The gender representation of the respondents was 69% female and 31% male. Approximately 50% of the scholars were Native American. No other minorities were represented among the scholars completing the surveys. There were nine (9) different tribal affiliations reported among the Native American scholars. A large number of Native American scholars (69%) reported being parents, which was in contrast to the relatively low number of non-minority scholars reporting themselves as parents (22%).

When asked to describe barriers encountered while pursuing a higher education degree, the scholars cited financial struggles (48%) most frequently. Among Native American scholars, adjustment to a new environment was also cited quite often (40%). Information pertaining to support systems both formal and informal, was also gathered in the survey. For formal support, 77% of the scholars reported the STEP Project was a helpful campus support. Individual staff (65%) and individual students (51%) was also a highly regarded support systems among the scholars. The informal support systems acknowledged were family (88%), friends (73%), and for Native American scholars, spiritual support (82%).

Scholar involvement in professional development opportunities and service projects was assessed via the survey instrument. The majority of scholars indicated that they had been offered the opportunity to participate in professional development opportunities as well as service projects and that these opportunities were beneficial. Participation in service projects was encouraged among the majority of the scholars.

The results of the telephone survey of the NSF teaching scholars indicated that the scholars program has been quite influential and successful in supporting these teaching candidates through financial assistance as well as through academic, cultural, and emotional support systems. Thirty-six percent of the graduated scholars are currently involved in an educational program or as a teacher in a school system. It is recommended that continued support from the STEP Program can be modified or shifted to address the needs of the scholars from the information that was gathered from the survey.
TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION
Statement of the Purpose ............................................. 3
Questions to be Answered ............................................. 4
Need for the Study .................................................... 4
Terminology .............................................................. 6
Limitations of the Study .............................................. 6
Organization of the Study ............................................. 7
Summary .................................................................... 8

CHAPTER II
RELATED LITERATURE
Introduction .................................................................. 9
Elementary/Secondary Enrollment ................................. 10
Higher Education ....................................................... 11
Teachers ................................................................. 13
Student Performance ................................................... 14
Summary .................................................................... 15

CHAPTER III
PROCEDURES
Introduction ............................................................... 17
Sources of Data .......................................................... 17
Population ............................................................... 18
Sample ...................................................................... 18
Sampling Procedures .................................................... 19
Construction of the Questionnaire Instrument .................. 19
Time Line for Data Collection ....................................... 20
Summary .................................................................... 20

CHAPTER IV
FINDINGS
Introduction .................................................................. 22
Subjective Information Reported by Scholars ................... 25
Barriers Encountered While Pursuing a Higher Education Degree ............................................. 25
Support Systems ....................................................... 26
CHAPTER 1

INTRODUCTION

The Montana STEP Project is a National Science Foundation (NSF) funded program which is designed to produce broad changes in the teaching of science and mathematics throughout the State of Montana with the main office housed at Montana State University in Bozeman, Montana. (Montana STEP Project, 1993)

The National Science Foundation awarded $6 million to Montana’s Systemic Teacher Excellence Preparation (STEP) Project. Montana was one of three states to receive the national award out of 37 applicants. The STEP Project as designed to train tomorrow’s top elementary and secondary mathematics and science teachers as part of a national agenda for educational reform. In June of 1993, The STEP Project received $6,000,000 in funding from the National Science Foundation (NSF) with an annual pool of scholarship funds of $100,000. The annual scholarships ranged from $1500 to $3000 for five years to teacher education candidates at the five colleges/universities and five of the seven tribal colleges. The statewide program was designed to improve teacher preparation throughout the Montana University System and within the state’s tribal colleges.

Statement of the Purpose

The major purpose of this study is to determine if the STEP scholars program has been influential and successful in supporting teaching candidates in the
mathematics and science teaching fields. The survey was developed and implemented in order to gather current data and information on the NSF scholars to see if the program had been influential and successful in supporting the teaching candidates to obtain their degree and gain employment as teachers in the math and science fields.

Questions to be Answered

The survey of the NSF Scholars was conducted in order to gather the following information:

1. To gather personal information specifically pertaining to current employment, family obligations, educational history, and individual goals. Basic demographic data on the scholars was obtained from the individual scholarship applications.

2. To identify the scholars' perceptions of the supports and barriers to the successful completion of their educational programs.

3. To identify the scholars' opinions on program structure, particularly pertaining to service requirements and professional opportunities.

Need for the Study

The need for the study was to find out if the STEP Project was successful in reaching its goals by assisting scholarship recipients in obtaining their degrees and employment in the Math and Science teaching fields by providing financial support as well as support systems to these recipients. The STEP Project was designed to produce broad changes in the teaching of science and mathematics throughout the state of Montana by increasing female and minority teachers in
these fields. The foundation of these changes is a system-wide improvement in the preparation of pre-service and early-career kindergarten through 12th grade science and mathematics teachers. The Project is intended to serve as a national model for use in rural areas with significant minority populations by increasing female and minority teachers to serve as role models to these students. One key component of the five-year grant was to increase the number of Native American mathematics and science teachers to serve as role models through partnership in the grant by five of the seven tribally controlled community colleges: Salish Kootenai College, Blackfeet Community College, Fort Belknap College, Fort Peck Community College, and Little Big Horn College. Another key component was focusing on classroom methods that encourage female students to excel in mathematics and science. During the life of the grant, more than 2,600 elementary and secondary teachers will receive training in the new techniques with the first group to begin teaching in 1995.

The statewide program was to improve teacher preparation throughout the Higher Education System in the State of Montana. A major effort was made to attract applications from prospective teachers who were members of the underrepresented groups in mathematics and science education, especially women and minorities. The NSF awarded $100,000 annually in scholarships from 1993 through 2000 to the STEP Scholarship fund which awarded scholarships ranging from $1500 to $3000 to students at the five university systems and the seven tribal colleges in Montana.
Terminology

The following terminology which was taken from the Montana STEP Program is given to aid the reader of the study.

**STEP:** Systemic Teacher Excellence Preparation.

**NSF:** National Science Foundation.

**Elementary level:** Consists of grades Kindergarten through the 8th Grade.

**Secondary level:** Consists of grades from the 9th Grade through the 12th Grade.

**Graduates:** A student receiving a Bachelor's Degree in Education from the Elementary or Secondary fields or Teacher Certification.

Limitations of the Study

This researcher included in her study 109 of the 127 scholars of the STEP recipients that received a scholarship from the STEP Project from the Fall 1999 to Spring 2000. Eighteen scholars were not contacted due to the fact that their current address and/or telephone numbers were not listed or unknown. The STEP Project required each scholarship recipient to choose one of the eight selected school model sites of the 100 schools within the state. The school model sites were schools where the scholars would be placed to perform their student teaching requirement. The sites were specifically selected by the STEP Project Committee. The researcher was unable to obtain data of teacher certifications that were issued in the specific fields of math and science since the records are not kept stating specific fields but rather general certifications in Secondary or Elementary Education. The researcher was further hindered due to the fact that both MSU-
Bozeman and the Office of Public Instruction were installing new computer systems which limited the availability and access to data regarding teacher certifications.

**Organization of the Paper**

This research paper is organized into five chapters. Chapter I shows the statement of the purpose, questions to be answered, the need for the study, the definitions of the terms, the limitations of the study, the organization of the paper, and a summary.

Chapter II presents a review of literature relating to this study. Chapter II is divided into the following areas:

1. Elementary/Secondary Enrollment.
2. Higher Education.
3. Teachers.
4. Student Performance.

Chapter III is a review of the procedures used in completing this paper. This chapter covers the sources of data, design of the instrument, time line, and participant selection.

Chapter IV contains the results of the survey that was conducted of the 109 scholarship recipients of the Montana STEP Program from 1993 through 2000. Findings of the survey are presented and analyzed.

Chapter V summarizes the study and includes the conclusions that will be drawn from the study as well as the author's recommendations resulting from the completion of the study.
Summary

The Montana STEP Project will hopefully be an essential ingredient for increasing effective mathematics and science teachers within the State of Montana through its scholarships for teacher education candidates. The STEP Project identified strategies that should be introduced in the science and mathematics method courses then reinforced in student teaching followed by experienced teachers mentoring first year or beginning teachers in an early career program. The STEP Project will focus on engaging female and minority students, especially Native Americans, in the mathematics and science fields through its scholarship program.
CHAPTER II

RELATED LITERATURE

Introduction

“Among the most serious problems confronting American Indian educators and tribal groups is that American Indian children have the highest dropout rate among all ethnic minority groups in the nation. Current statistics suggest that 50 percent of all American Indian students now enrolled in school will not graduate. Research further indicates that American Indian females are more likely to drop out than Indian males.” (Bowker, 1993)

Why are the mathematics and science fields under represented by females and minorities in the United States? This question and issue has become one of the major objectives of the National Educational Reform and the National Science Foundation which is to increase the number of females and minorities through programs like the Montana STEP Program. In the fall of 1996, about 66.1 million persons were enrolled in American schools and colleges. About 4.0 million were employed as elementary and secondary school teachers and as college faculty. In a nation with a population of about 265 million, more than one out of every four persons participated in formal education. (U.S. Department of Education, 1996).

Current demographic trends indicate that further public school students will increasingly consist of the poor, the disadvantaged, and the minority groups. In contrast to the white population, minority populations in the United States are younger and will continue to grow, and the children coming into the schools will be
more ethnically and linguistically diverse than ever before in the nation's history. These children because of poverty, cultural obstacles, or linguistic differences, tend to have low academic achievement and high dropout rates. Such students are heavily concentrated among minority groups, immigrants, non-English speaking families and economically disadvantaged populations. (National Foundation for the Improvement of Education, 1986)

Elementary/Secondary Enrollment

The National Center for Education Statistics (NCES) predicts record levels of enrollment for minority groups during the late 1990s. It is anticipated that by the year 1997, public school enrollments will surpass the previous high set in 1971 and will continue to climb into the next century. Between the fall of 1996 and the fall of the year 2000, public elementary enrollment is projected to grow by 3 percent, while public secondary school enrollment is expected to rise by 6 percent. (U.S. Department of Education, 1996).

"Enrollment in elementary and secondary schools grew rapidly during the 1950s and 1960s and peaked in 1971. This enrollment rise was caused by what is known as the "baby boom," a dramatic increase in births following World War II. From 1971 to 1984, total elementary and secondary school enrollment decreased every year, reflecting the decline in the school-age population over that period. Then once again, there was an increase from 1986 to 1996, which was concentrated in the elementary grades, but the pattern is expected to change. The
growing numbers of young pupils that have been filling the elementary schools will cause significant increases at the secondary school level during the mid-1990s. Between the fall of 1996 and the fall of 2006, public elementary enrollment is projected to grow by 2 percent, while public secondary school enrollment is expected to rise by 15 percent. Moreover, by 1997, public school enrollment is projected to surpass the previous high set in 1971 and is expected to continue to increase into the next century." (U.S. Department of Education, 1998).

Higher Education

College enrollment rose to a record level of 14.5 million in fall of 1992 and is expected to return to nearly that level in 1996, after falling slightly between 1993 and 1995. Despite decreases in the traditional college-age population during the 1980s and early 1990s, total enrollment has remained relatively high because of the increased participation of older women students and a high rate of college attendance for recent high school graduates. The number of degrees conferred by institutions of higher education is estimated to have been at an all time high during the 1997-98 school year as shown in Table 1:

<table>
<thead>
<tr>
<th>DEGREES IN 1997-1998</th>
<th>NUMBER OF STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Degrees</td>
<td>530,000</td>
</tr>
<tr>
<td>Bachelors Degrees</td>
<td>1,192,000</td>
</tr>
<tr>
<td>Masters Degrees</td>
<td>405,000</td>
</tr>
<tr>
<td>Doctors Degrees</td>
<td>43,000</td>
</tr>
</tbody>
</table>
Total college enrollment is expected to increase slowly during the remainder of the 1990s, as increasing numbers of older women students and high school graduates pursue higher education. As stated by the U.S. Department of Education in 1998, the United States total percent of Americans with a bachelor's degree or higher is 20.3% while the percentage of each group with bachelor's degree or higher can be seen in Table 2:

<table>
<thead>
<tr>
<th>U.S. Ethnic Groups with Bachelor's Degree</th>
<th>Total Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian Pacific Islanders</td>
<td>36.6%</td>
</tr>
<tr>
<td>Whites</td>
<td>21.5%</td>
</tr>
<tr>
<td>Blacks</td>
<td>11.4%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>9.2%</td>
</tr>
<tr>
<td>American Indians</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

While Montana's percentage with bachelor's degree or higher as shown in Table 3:

<table>
<thead>
<tr>
<th>MT Ethnic Groups with Bachelor's Degree</th>
<th>Total Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian Pacific Islanders</td>
<td>32.1%</td>
</tr>
<tr>
<td>Whites</td>
<td>20.3%</td>
</tr>
<tr>
<td>Blacks</td>
<td>18.4%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>10.9%</td>
</tr>
<tr>
<td>American Indians</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

An Educational Testing Service report projects that blacks, Hispanics, and Asian/Pacific Islanders will make up 80% of the increase among all 18- to 24-year olds academically qualified for college. The study "Crossing the Great Divide: Can
We Achieve Equity When Generation Y Goes to College?" - is based on school achievement tests and national and state population figures. Its projections address enrollment at the nation's more than 4,000 two- and four-year institutions. The survey examined enrollment prospects from 1995 to 2015. It defined eligible students as those able to meet or exceed college admission requirements. The study estimates that the number of full-time undergraduates will reach 16 million 15 years from now, up from 13.4 million five years ago. The Educational Testing Service projected that by 2015, the numbers of black, Hispanics, and Asian/Pacific Islander undergraduates will grow by about 2 million, and they will account for 37 percent of the nation's undergraduates. In 1995, minorities represented 29 percent of the nation's undergraduates as reported in the Bozeman Daily Chronicle on May 25, 2000.

**Teachers**

An estimated 3.1 million elementary and secondary school teachers will be engaged in classroom instruction in the fall of 1997. This number has risen about 18 percent since 1986. About 1.9 million teachers are expected to teach in elementary schools, while about 1.2 million will teach at the secondary level. The number of public school teachers has risen at a slightly faster rate than the number of students over the past 10 years, resulting in a small decrease in the student/teacher ratio. This has also been reflected in the smaller class size with the average being 24 students. The percentage of Montana teachers grouped by race
and ethnicity in 1986 were as shown in the following Table 4:

<table>
<thead>
<tr>
<th>MT Teachers in 1986</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>92.7%</td>
</tr>
<tr>
<td>American Indians</td>
<td>5.5%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>.9%</td>
</tr>
<tr>
<td>Asian Pacific Islanders</td>
<td>.5%</td>
</tr>
<tr>
<td>Blacks</td>
<td>.3%</td>
</tr>
</tbody>
</table>

In 1994, the percentage distribution by race and ethnicity among Montana teachers were as shown in the following Table 5:

<table>
<thead>
<tr>
<th>MT Teachers in 1994</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>87.7%</td>
</tr>
<tr>
<td>American Indians</td>
<td>9.6%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>1.4%</td>
</tr>
<tr>
<td>Asian Pacific Islanders</td>
<td>.8%</td>
</tr>
<tr>
<td>Blacks</td>
<td>.5%</td>
</tr>
</tbody>
</table>

As shown in the above tables, there has been an increase in the percentage distribution of Montana teachers from 1986 to 1994 among the minority teachers. (U.S. Department of Education, 1998).

**Student Performance**

Student achievement has improved in many areas especially for minority children in mathematics and science. Improvements for all students during the
1980 to 1992 period were more consistent in the areas of mathematics and science than in reading. Results from assessments of mathematics proficiency indicate that students have made some improvements in their skill with basic computations. However, the performance of older students on advanced mathematical operations has shown little change. Sizable increases were also registered by minority students, with increases among black and Hispanics. No state experienced a significant decline in achievement. Student improvements were also registered in science proficiency between 1977 and 1992 for the age groups of 9 year olds, 13 year olds, and 17 year olds. Black and Hispanic students at all three ages performed significantly better in 1992 than in 1977. (Escalante, 1996).

Summary

Disadvantaged students are not a new phenomenon in U.S. schools. However, the size of the disadvantaged student population will assume unprecedented proportions in the coming years. Failure to anticipate the coming changes in the composition of the student population and to plan appropriate responses will leave us not with the same educational problems we face today, but perhaps with problems so severe and so widespread as to threaten our economic welfare and even our social political stability. (A.M. Pallas, G. Natriello, and E.L. McDill, 1989.)

The statistical highlights as stated by A.M. Pallas, G. Natriello, and E.L. McDill in their paper provide a quantitative description of the current American education scene. Clearly, from the large number of participants, the number of years that people spend in school, and the large sums expended by educational institutions, it is evident that the American people have a high regard for education.
Americans have become more educated with a slight overall increase in education among the minority groups. A higher proportion of older women students and high school graduates are going on to college. Assessment data indicate that there have been improvements in the mathematics and science performance all groups of students between 1982 and 1992. As previously shown in Tables 4 and 5, there has been an increase in the percentage distribution by race or ethnicity among Montana teachers from 1986 to 1994. Tables 4 and 5 also shows that all of the minority groups of teachers in Montana had increased while the percentage of White teachers has decreased from 92.7% in 1986 to 87.7% in 1994. The data shown in Tables 3-5 shows that the gap between the minority group of teachers when compared to the white teachers has slightly decreased while the percentage of American Indian Teachers has increased according to these tables. This may be contributed to programs such as the STEP Project which has assisted undergraduate teaching candidates in obtaining their teaching certification through their scholarships for minorities. The STEP Project has given disadvantaged students an opportunity to close the ethnic gap among teachers in state of Montana which in turn will provide positive role models for the minority and disadvantaged students in the state.
CHAPTER III
PROCEDURES

Introduction

The major purpose of this paper was to determine if the Montana STEP Project housed at Montana State University-Bozeman has been influential and successful in supporting the teaching candidates through financial assistance as well as through academic, cultural, and emotional support systems. The survey was also used to determine if the project has increased the number of female and/or minority teachers in the mathematics and science teaching fields.

Chapter III will examine the following areas: 1) sources of data, 2) population, 3) sample, 4) sampling procedures, 5) construction of the survey instrument, 6) timeline for data collection, and 7) summary.

Sources of Data

The data for this research paper was collected through reference materials from the Montana STEP Project’s data collection, the Renne Library at Montana State University-Bozeman, and the STEP scholarship recipients from the five universities/colleges and five of the seven tribal colleges in the state of Montana. The Montana STEP Project provided background information on all of its scholarship recipients from prior questionnaires and scholarship applications. The
Renne Library provided the sources for related literature including books, reference articles, and journal articles. Additional data was gathered through a telephone survey in which 109 of the 127 scholars was contacted by the researcher. The related literature by Ardy Bowker and the Montana STEP Project implied that the number of female and minority students in the mathematics and science fields has slightly increased from 1984 to the present. The figures from the U.S. Department of Educational Statistics also show that the number of female and minority teachers in the state of Montana has slightly increased during the same years.

**Population**

The research population was the total number of scholarship recipients from the Montana STEP Project who are obtaining and/or who received a Bachelor's Degree in Elementary or Secondary Education from the College of Education. The total number of Montana STEP Project recipients consisted of 127 from the five universities/colleges and the seven tribal colleges located throughout the state of Montana.

**Sample**

The sample size consisted of 109 of the 127 scholarship recipients from the Montana STEP Project. Eighteen scholars were not contacted due to the fact that their current address and/or telephone numbers were not listed or unknown. It was felt that the sample size of 109 was a true reflective if the STEP Project had
been influential and successful in increasing the total number of female and minority teachers in the state of Montana.

**Sampling Procedures**

The sampling procedures was a telephone survey in which the researcher contacted each scholarship recipient by telephone. The researcher contacted 86% of the scholarship recipients by telephone between April and June, 2000. The researcher also used information from the individual scholarship recipient's application forms and the STEP Project personnel data information files.

**Construction of the Questionnaire Instrument**

The questionnaire instrument which will be used for this study (see Appendix) was created by the researcher through the use of prior questionnaire instruments that was used by the STEP Project. This information provided a framework for the questions that appeared on the final telephone survey instrument.

The telephone survey was used to question the STEP Project Scholarship Recipients who were obtaining and/or graduating from the College of Education with a Bachelor's Degree or a Teacher's Certification in Education with an emphasis on Science and/or Math. The telephone survey contained questions relating to personal data, gender, degree, employment, opportunities, and barriers.

The initial questionnaire instrument was reviewed by the researcher's professor, Dr. Norman Millikin, College of Business, Montana State University-
Bozeman and the Director of the STEP Project, Dr. Elizabeth Swanson. The survey instrument was also examined by the business education graduate students in the Research Procedures Class in the Business Education program during the summer of 1997. Upon completion, the instrument was reviewed by NSF scholars, STEP graduate research assistant Margie Loud Hawk, and STEP Evaluator Carol Thoresen with the final revisions made by the STEP Director, Elizabeth Swanson.

**Time line for Data Collection**

March, 2000..............................Completion of the instrument

April 3, 2000..............................Pilot Survey - NSF scholars

April 4, 2000..............................Final approval

April 16- June 14, 2000...............Telephone Surveys Conducted

June 15-16, 2000.......................Data Analysis

June 21, 2000............................Final report completed

**Summary**

Chapter III examined the following areas: sources of data, population, sample size, sampling procedures, construction of the survey instrument, and time line for data collection. The information that will be gathered from the above areas will determine if the Montana STEP Project housed at Montana State University-Bozeman has been influential and successful in supporting the teaching candidates through financial assistance as well as academic, cultural, and emotional support
systems. The questionnaire instrument consisted of questions that covers these areas. The instrument was reviewed by Dr. Norman Millikin and the business education graduate students during the summer of 1997. A pilot test was conducted on April 3, 2000 on the present STEP scholarship recipients of 1999-2000. The STEP Advisory Committee at Montana State University-Bozeman tested the validity of the questions with the Director of the STEP Project giving final approval. The telephone survey participants will consist of the 127 scholarship recipients during the seven years of the project from 1993 to 2000.
CHAPTER IV

FINDINGS

Introduction

A telephone survey was conducted of the NSF Teaching Scholars across the State of Montana who are obtaining or graduated with a degree in Secondary and Elementary Education. The telephone surveys were conducted during the evening hours between 6:00 PM and 8 PM during a two month period with a 86% contact rate (109 of the 127 scholars). The telephone surveys were used to collect data on the individual recipient’s demographics, current employment status, influences on selecting current degree program, opportunities and barriers encountered while pursuing a higher education degree, personal characteristics and strengths for teaching, support systems, and professional development/service projects.

The demographic information included the gender breakdown of the survey respondents. The ratio of females to males among the non-minority scholars was identical to that of the Native American scholars. There were 60 females and 49 males. The scholars were asked which university/college they attended. The researcher felt that it might be important to group responses to various survey items according to four-year programs versus tribal colleges. From this data it was
determined that, at the time of the survey, 67% of the scholars were attending larger, four year institutions and 33% of the scholars were in the smaller tribal college setting.

Information pertaining to the tribal affiliation and residence of the Native American scholars indicated the demographic and cultural diversity within this group. The Native American scholars represented nine different tribes from four different states. The nine tribes represented were the Chippewa-Cree, Navajo, Blackfeet, Gros Ventre, Confederated Salish and Kootenai, Crow, Fort Peck Tribes, Sisseton Sioux Nation, and Western Shoshone. The four states represented were Montana, Arizona, South Dakota, and Nevada.

The Native American scholars were asked where they were raised. Eighty seven percent of these scholars reported being raised on an Indian Reservation, five reported off the reservation, one reported a border town, and one reported an urban setting. This inquiry was included because the researcher felt this information would influence various aspects of the scholar's educational experience. The Native American scholars that reported being raised on a reservation indicated close ties to their tribal culture and traditions.

The ages of the NSF Scholars was not part of the information requested on the survey, however, this information was gathered through the scholarship application form. The ages of the 109 scholars who participated in the telephone survey ranged from 18 to 40 years of age. The Native American scholars are
broken out from the non-minority scholars, as there appear to be differences between the two groups in this demographic feature. The majority of the non-minority scholars fit within the traditional college-age demographics of 18 to 25 years of age (69%), however only 29% of the Native American scholars are in this category of 18-25 years age group. A major group of the Native American scholars (53%) fell within the 31-40 age group with five falling within the 26 to 30 age group and five in the 40+ group. One non-minority scholar did not report the age information on her application.

The educational history of the two groups of NSF scholars also reflects the differences in their life situations. Many of the Native American scholars had received education beyond high school as indicated by the larger percentage of associate degree holders. However, only one of these individuals had been able to obtain a bachelor level degree. The non-minority scholars have the characteristics of the more traditional college-age students. Currently, they are enrolled in their first attempt at a post-secondary degree and the majority of these non-minority scholars fit within the traditional college student age group.

Part Two of the telephone survey consisted of subjective information reported by scholars. Three free-response questions were asked in the telephone survey. Free-responses were recorded, clustered into categories, and summarized. The clustering categories were determined based upon the scholar responses. For example, responses sharing a common theme were clustered together and made
up one category. The frequency of responses within a category listed in this report indicates how often that category was cited by the respondents.

Subjective Information Reported by Scholars

The scholars were asked to indicate what influenced their decisions in selecting a secondary education degree in math/science or an elementary education degree program as their fields of study. When responses from both groups of survey participants of non-minority and Native American scholars were combined the most frequently reported influence was the desire to contribute toward a positive change. However, when the responses of the two groups were separated some distinct differences surfaced. Among non-minority scholars, personal strength in or affinity for the subject area was the most frequently cited influence on their selection of their current degree program. By contrast, the Native American scholars rated cultural reasons, the desire to contribute to positive change, and the desire to work with children equally as important influences on selecting their current degree programs.

Barriers Encountered While Pursuing a Higher Education Degree

The second open response question stated, “Describe the barriers you have encountered while pursuing a Higher Education Degree.” This information was sought in order to understand reasons for attrition, particularly among the under-
represented groups of scholars. Some of the barriers cited included the following financial struggles, trouble adjusting to a large university environment, lack of time, and balancing work and family.

Once again, due to the differences in the responses of the two groups, the responses of non-minority scholars and Native American scholars are broken out and reported separately. Financial concerns appear to be a tremendous issue and barrier for the Native American scholars, as 64% of the respondents indicated this was a struggle they encountered during their educational endeavor. In contrast, only 31% of the non-minority scholars cited financial issues as a barrier. Adjustment to a new environment was reported to be a barrier for 40% of the Native American scholars while only 5% of the non-minority scholars cited this as a barrier.

The third free response question asked, “What personal characteristics and/or strengths do you feel will enable you to be an effective teacher?” The most frequent response was compassion for others and children followed by communication skills, creativity, tenacity, personal culture, and leadership skills.

Support Systems

The purpose of including survey questions about available campus support was to evaluate student perceptions of what support systems were the most valuable in their undergraduate program. The first survey question was, “What campus support has been most helpful to you?” The respondents were then given
a list of institutional support possibilities. The selections were summarized and ranked by frequency of response with the STEP Program ranked number one by both non-minority and Native American scholars. Among both groups the STEP program, individual staff members, individual students, and other supports which included family, peer groups, co-workers, and advisors were selected most frequently. However, differences between the two groups of scholars were seen in relation to perceived support from programs designed for the support of minorities and Native American students. Such programs as AISES, AIRO, the Indian Club, Indian Staff Members, and Advance By Choice were cited as support systems for the Native American group but not by the non-minority group.

Following the campus support system question, scholars were asked, "What informal support systems have been most helpful to you?" Scholars chose from four possible selections: family, friends, spiritual, and other. The support of family was selected very frequently (89%) by both groups of non-minority and Native American scholars. The support of friends was the same by both groups (74%). However, spiritual support was selected more often by the Native American scholars (82%) than non-minority scholars (39%).

Professional Development/Service Projects

Part of the scholars program's mission is to empower these students, at many levels, so they view themselves as professionals in the field of education.
Additionally, the interaction with practicing professionals for learning and motivation is also encouraged. With these two goals in mind, the STEP NSF teaching scholar, are encouraged to take part in professional development activities and service projects. These activities and projects are designed to increase exposure to professional educators and programs in order for scholars to gain greater perspective for the teaching profession and related educational issues. Examples of professional development activities offered during the academic years have included attendance at various meetings of professional societies such as the National Science Teachers Association, Montana Education Association (MCTM) as well as STEP sponsored events such as diversity conferences and the STEP Early Career Conference.

A. Professional Development Experiences

Questions posed to the scholars included, "Have you been offered any opportunities to attend professional meetings, conferences, workshops, and/or seminars?" and "Did you find them beneficial to you?" In response to these inquiries, all of the scholars indicated that they had been offered the opportunity to attend a professional development activity. Of these 109, 87 responded that they found such opportunities beneficial. The discrepancy between these two values may be due to the fact that, although several scholars were offered the opportunity, not all of those offers resulted in actual participation. For example, explanations such as the following accompanied the scholars' responses to this item:
I was unable to attend because of prior commitments or school conflicts. (MSU Northern Scholars)

I was not able to attend due to work commitments. (MSU Billings Scholar)

Another possible explanation for the lower percentage reporting the professional development opportunities as beneficial may have been due to their attending events which were not geared to their areas of interest. The following quotation was noted in one scholar’s response:

Some are beneficial because they are geared toward elementary education and/or math and science at those levels. Others are geared toward higher level math and science or other areas that I have little knowledge. (U of M Scholar)

Overall, however, the scholar accompanying explanations expressed positive impressions and personal gain from their participation in professional development experiences.

B. Service Projects

The next question asked, “Have you been encouraged to do a Service Project?” Responses to this question were somewhat different for the non-minority scholars as compared to the Native American scholars. Of the 54 non-minority scholars, 53 reported that they had been encouraged to do a service project, yet only 35 of the 55 Native American scholars reported this. Free response explanations to this question included the following:

I was employed with Project WET (Water Education for Teachers) and developed workshops on campus to share environmental concerns centered around water. As a Blackfeet, water is the center of our lives so it tied culturally with my education. (U of M Scholars)
Not really but that was my fault. I really feel it is a necessity to do this but did not take advantage of the opportunity to participate. (MSU-Bozeman Scholar)

Each year I have done a service project either in a elementary classroom or at local school science fairs. This year, we are trying to do a group service project. (Non-minority U of M Scholar)

I declined to participate in a long term project because of my work load. I did participate in tutoring in the math learning center. (Non-minority Western Montana College Scholar)

The responses to this question were also compared for those scholars attending four-year universities and those attending two-year tribal colleges. Although the representation of scholars from tribal colleges was small (N=36), a comparison of the responses indicates that those scholars attending 4 year universities (N=73) were more likely to have been encouraged to do a service project. Of the four year university scholars, 89% indicated they were encouraged to participate in a service project where only 43% of the tribal scholars gave this answer. However, what appears to be a lesser degree of involvement in service projects among tribal college scholars may be due to a lack of recognition of what makes up a service project. Many of the Native American students at the tribal colleges have reported to the scholar coordinator, Saralyn Sebern, they were involved in peer tutoring. This service is set up by the tribal college instructors yet may not be labeled as a service project by these instructors.
STEP Support for Professional Development/Service Experiences

The final question related to professional development experiences and service projects was, "How can the program better serve you with professional activities and/or support for doing service project activities?" Some of the common responses included no change; the scholars were very satisfied with professional activities and/or service project activities; need more/better information on opportunities; publicize the STEP scholars program better; and make service activity a more prominent goal of the program.

Aside from satisfaction with the current program structure, the next most frequently cited category was the need for more and/or more detailed information pertaining to the available service project opportunities. Responses related to this included the following:

Send the scholars a list of options or ideas that they could do for a service project. Some suggestions. (U of M Native American Scholar)

Keep the students up-to-date on what is going on in the real world. As a student it is tough to keep up on conferences and other pertinent material outside of course work. (U of M Native American Scholar)

Maybe have a written list of possible projects along with contact names and phone numbers. (MSU-Bozeman Non-minority Scholar)

Two scholars indicated that program publicity to the community might create professional development/service opportunities.
CHAPTER V
SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Introduction

The NSF Teaching Scholars telephone survey provided both demographic information and scholar perceptions of the program. It was clear from the findings that situational differences exist between the Native American and non-minority scholars. These differences may very well translate into varying success rates in undergraduate education programs. As of the completion of this report 19 of the 63 Native American students who have received the NSF teaching scholarships since the inception of the program have either dropped out, transferred out of an education program, or transferred schools. This compares to only 2 of the 64 non-minority scholars.

Issues Related to Scholars Personal Information

As indicted in the findings, the profiles of the Native American scholars differ from those of the non-minority scholars. The Native American scholars are generally older students who are not fresh out of high school. Additionally, these Native American scholars are much more likely carrying the added responsibility of parenthood. Along with this status comes increased financial pressures, social
responsibilities, lack of flexibility, and a greater need for efficient time management. Their own educational pursuits may often have to take a back seat to more immediate family needs. Student support systems within an educational program or at the institutional level must acknowledge the unique issues and obstacles encountered by non-traditional students. Many of the institutions do have support programs for non-traditional students, yet the utility of these existing services such as non-traditional age student support groups and university childcare were not assessed in this telephone survey instrument. The value of the non-traditional aged student is recognized by university faculty as these older students tend to be more focused on their disciplines and display a maturity and work-ethic less evident in the younger student.

The researcher felt that the tribal affiliation of the Native American scholars was important to acknowledge in this paper because of the varying cultural, linguistic, and religious differences which exists between the individual Indian nations. In light of the fact that nine separate tribal affiliations were reported by the scholars the importance of a sound understanding of the issues pertinent to these distinct groups becomes evident. Presently, Saralyn Sebern as the Coordinator fills this role of the central STEP staff person well-versed in the issues pertaining to the individual scholars with the various tribal affiliations. The varied tribal representation which was defined through this survey serves to emphasize the importance of a central support person such as Saralyn Sebern, within the scholars program, who
has some knowledge of the distinct Native American cultures. Additionally, since the majority of the Native American scholars did report their homes as being on a reservation, an emphasis should continue to be placed on interaction with the tribal service establishment on the various reservations.

**Perceived Supports and Barriers to Successful Completion of Program**

In considering the great contrast in reported barriers between the non-minority scholars and the Native American scholars, it becomes evident that retention efforts may need to be focused on the individual groups of scholars and that a general approach to retention of the group as a whole may not be appropriate. With this in mind, the following recommendations pertaining to supports and barriers to successful completion of their undergraduate education programs are brought forth:

- As financial concerns were of great importance to the scholars surveyed (particularly the Native American scholars) it is recommended that the scholars committee continue the practice of funding through graduation and/or teacher certification.

- In order for financial concerns to be lessened, assistance should be provided to aid scholars in securing additional financial support. Perhaps the scholars committee could be the liaison between the scholars and their campus financial aid staffs.

- Spirituality is valued highly among the Native American scholars and many of these scholars indicated that adjustment to the larger university setting was very challenging. Therefore, an effort to help link avenues of spiritual support at the larger university setting for these individuals is recommended.
The life situations of many scholars dictate that their financial and emotional focus involves much more than their academic endeavors. Support for these individuals such as time management seminars, financial management seminars, and exposure to child care resources may help to alleviate some of the additional pressures brought about by trying to balance their many responsibilities.

Enhance the recruitment effort for traditional-aged Native American students. By focusing efforts on this group, which is relatively under-represented according to the results reported here, the problems of family obligations and financial difficulties would be lessened.

**Service Requirements/Professional Opportunities**

The professional development opportunities and service projects in which the NSF teaching scholars become involved throughout their undergraduate experience will provide valuable mentoring. Exposure to teaching issues and resources along with greater confidence will guide and assist them during the early years of their teaching careers. The findings of this survey indicated that the scholars value these extracurricular activities, and in fact, most of the scholars do take part in both facets of the program. Those scholars who indicated they did not either participate in or benefit from the service or professional development opportunities generally cited either a lack of guidance or a lack of time as the reasons for their non-participation. There was some disparity in the degree of participation in service projects when comparing the Native American scholars to the non-minority scholars. Some recommendations pertaining to the service/professional opportunity aspects of the NSF teaching scholar program include the following:
• Greater exposure of the NSF teaching scholar program within communities in which scholars live to promote increased local opportunities for service projects.

• Professional development opportunities/networking via telecommunications technology to aid those in rural locations who lack both time and funding to travel to such events.

• Equity in professional development offerings between those geared toward elementary educators and those geared toward secondary educators.

• Increasing the awareness and utilization of the central resource unit which disseminates information pertaining to upcoming professional development opportunities (scholar coordinator).

• Enhancing the funneling of information pertaining to development opportunities from the various regions of the state to the central scholar coordinator.

• As the service project opportunities arise and exist on the local level, have the local campus contacts check-in periodically with the scholar coordinator to provide an update as to the participation in and availability of service projects for scholars.

In summary, the results of the NSF teaching scholars survey indicate that the scholars program has been quite influential and successful in supporting these teaching candidates through financial assistance as well as through academic, cultural, and emotional support systems. The most significant barriers to successful completion of a program have been identified by the scholars as financial concerns and trouble adjusting to a new environment. With this information, continued support can be modified or shifted to address these needs of the scholars and/or future scholars. The existing support systems vary from campus to campus. Each separate institution must evaluate where needs exist on its campus and make
adjustments accordingly.

The additional personal information gathered through this survey has helped to clarify the scholar profile by specific academic and social situation. This information will guide the program to address the needs of the scholars and adjust approaches to optimize scholars' potential for success. Ultimately, the program's success will be measured by the number of graduates who become adept teachers and active education professionals within an educational system.
BIBLIOGRAPHY


APPENDIX
STEP NSF SCHOLARS TELEPHONE SURVEY

FALL 2000

Are you:

a. ___ Single
b. ___ Married Parent
c. ___ Single Parent
d. ___ Married with no children
e. ___ Other (Please explain: ______)

If you have children:

a. ___ Number of children  b. ___ List ages of children

Your Gender:

a. ___ Male  b. ___ Female

Tribal Affiliation: __________________________ State: __________________________

Where do you call home: __________________________

Were you raised primarily:

a. ___ On Reservation  b. ___ Off Reservation  c. ___ Border Town to Reservation
d. ___ Urban  e. ___ Other (Please specify)

Educational History: (List all schools and dates attended or graduated)

Elementary: __________________________

Middle School: __________________________

High School: __________________________

College: __________________________

Highest diploma or degree you currently hold: __________________________

Present Degree Program: Major __________________________
                        Minor __________________________
What Teacher Certification/Endorsements do you seek:

Elementary Education: __________________________
Minor: __________________________

Secondary Education: __________________________
Minor: __________________________

Are you presently employed: _____yes _____no

Current job title: __________________________

Number of hours per week __________________________

What influenced you to select a Math, Science, and/or Elementary Education Program as your field of study?

________________________________________
________________________________________
________________________________________
________________________________________
________________________________________

Describe the barriers you have encountered while pursing a Higher Education Degree: __________________________

________________________________________
________________________________________
________________________________________
________________________________________

What personal characteristics and/or strengths do you feel will enable you to be an effective teacher?

________________________________________
________________________________________
________________________________________
________________________________________
________________________________________
What campus support has been most helpful to you?

_____STEP  _____Advance By Choice  _____Indian Club

_____AISES  _____Counseling Services  _____Tribal Services

_____AIRO  _____Center for Bilingual Educ.  _____Tutoring

_____Individual Staff  _____Individual Students  _____Advisor

_____Indian Studies Dept.  _____Other Support: ______________________________

_____Other Academic Department (specify dept) ______________________________

Please explain why you feel these support(s) have been most helpful to you:

What informal support system(s) have been most helpful to you?

_____Family  _____Friends  _____Spouse

_____Spiritual  _____Other

Please Explain:
NSF Scholars Professional Development/Service Projects:

a. Have you been offered any opportunities to attend professional meetings, conferences, workshops and/or seminars?
   ____yes  ____no

b. Did you find them beneficial to you?
   ____yes  ____no
   Please explain:

   _____

c. Have you been encouraged to do a Service Project?
   ____yes  ____no
   Please explain:

   _____

d. How do you feel the program can better serve you with professional activities and/or support for doing service project activities?

Call Back Message:

What would be the best time to call you?

Days:  S  M  T  W  T  F  S         Hours:_________________ AM or PM

Phone Number:____________________

Name:_____________________________   E-mail address:____________________