Follow-up evaluation of the agriculture minority summer research internship program

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Follow-up evaluation of the agriculture minority
summer research internship program

by

Nicole Lynn Gale

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Agricultural Education

Program of Study Committee:
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Iowa State University
Ames, Iowa
2002

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This is to certify that the doctoral dissertation of

Nicole Lynn Gale

has met the dissertation requirements of Iowa State University

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For the Major Program
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ABSTRACT

As the world becomes more diverse, campus and communities must provide opportunities and conditions conducive to learning for all students of color. Iowa State University is attempting to increase awareness about agriculture-related areas among minority high school and undergraduate students. The College of Agriculture has sponsored an Agriculture Minority Summer Research Program (AMSRIP) each summer since 1994. Students utilize experiential learning skills working under the guidance of faculty mentors to conduct research in agriculture-related areas.

The primary purpose of this study was to evaluate the impact of the experiences students received while attending the Iowa State University Agriculture Minority Summer Research Internship Program. A second purpose of this study was to assess the effectiveness of the AMSRIP as a recruitment and retention tool. This research addresses experiential learning, recruitment strategies, retention methods, and career exploration relating to minorities, specifically within agriculture-related areas.

A descriptive survey method was used in this census study to collect data from 1998-2001 for Agriculture Minority Summer Research Interns. A total of 85% of the former interns completed and returned the survey.

Results of this study indicate that participants were interested in attending the internship program to gain research experience. Respondents indicated they were interested in learning more about the career options available to them in agriculture-related areas. The program is successfully recruiting and retaining minority students in agriculture-related
areas. Based on the results of this study, the program has an 18% return on investment. The overall expectations and perceptions of the interns for the program were met.

This study serves as a model for internship programs in other colleges at Iowa State University as well as other institutions. The program is not only benefiting minority students but the College of Agriculture at Iowa State University, and the society as a whole.
CHAPTER I. INTRODUCTION

For many individuals, especially minority students, education becomes the driving force to success. Education, according to the Merriam-Webster On-Line Dictionary, is to train by formal instruction and supervised practice especially in a skill, trade, or profession (http://www.mw.com/home.htm). Minorities, individuals from underrepresented non-white ethnic groups have not always had the opportunity to be educated. According to the above definition, African-Americans, Asian-American/Pacific Islanders, Latinos/Hispanic-Americans, and Native-Americans/American Indians are representatives of these ethnic groups. For youth from these represented ethnic groups, higher education often serves as the best means for social mobility (United States Department of Education, 1997).

The Morrill Act of 1862 provided federal land to each state for the establishment of a public institution, known as land-grant colleges. These colleges taught practical and liberal education to members of the working class in agriculture, military tactics, and mechanic arts (Seevers, Graham, Gamon, Conklin, 1997; NASULGC, 1995). During this time period, blacks were not allowed admittance into these institutions. It was not until the 2\textsuperscript{nd} Morrill Act of 1890 that federal funding was provided for the 17 predominantly black colleges (NASULGC, 1995). Other mandates such as Brown v. Board of Education (1954) eliminated legal separation in all education (Roebuck & Murty, 1993). In 1994 the Native Americans were also given land-grant status for 29 of their colleges.

Education for the working class was available, but most still could not afford the financial cost to attend. The Higher Education Act (HEA) of 1963, the Civil Rights Act of 1965 and the Education Amendments of 1972 made this financial burden much easier.
Federal aid was given to colleges in the form of pell grants and loans, this supplemented the tuition for most economically disadvantaged students, making it possible for them to obtain an education at the college level (Roebuck & Murty, 1993). Since 1980, the United States Department of Education has enforced the federal commitment to assuring access to equal educational opportunity for every individual (http://www.ed.gov/). Making education inclusive and not exclusive.

Education is a lifelong learning experience. As lifelong learners, individuals are constantly acquiring new information. As today’s society becomes more technologically advanced, people strive to increase their knowledge base. Youth are exposed to more information and learn at a more rapid pace than ever before because primary and secondary classrooms are now equipped with televisions, computers, and other modern equipment. Hands-on learning is essential and requires students to take an active role in the learning process. Using computer-based technology allows students to be responsible for their own engaged learning (North Central Region Educational Laboratory, 2001). Involvement in the total learning experience and learning by doing are definitions of hands-on learning made by primary educators (North Central Region Educational Laboratory, 2001).

After high school, more students than ever before, are enrolling in some type of post-secondary education. According to the U.S. Census Bureau (1998), 12.6% of Blacks, 8.8% of Hispanics, and 6.5% of Asian and Pacific Islanders were enrolled in college, compared to the 70.8% of Whites. These numbers have increased for minorities and are expected to continue to rise.

As the national enrollment of students in college has risen in general, Iowa State University (ISU) has also experienced an increase in enrollment. A total of 26,110 students
enrolled at Iowa State University in fall 1999, an increase of 525 (2.0%) over the previous year's enrollment (Iowa State University Office of Institutional Research, 2000). The number of minority students attending Iowa State University increased as well. The minority freshman class of 1999 represented 8% of the total freshman class compared to the total campus minority figures of 6.7% (Iowa State University Daily, 2000). Efforts to recruit, retain, and graduate minority students continue to remain a major component of Iowa State University's strategic student enrollment plan.

As the world becomes smaller and more diverse, as a result of communication and technology, it is important to consider diversity in the field of agricultural education as well. Since 1990, about 23 million people have been added to the United States population. African-Americans are currently the largest minority group, accounting for a combined 12.1 percent of the population (AmeriStat, 2001). However, Hispanics are the fastest growing ethnic group. Minorities and women are most certainly underrepresented in the agricultural education professions across the nation. Anyone can observe this disparity in many agricultural education meetings, at any level of the profession (Whent, 1994). Jones (1994) recognized that being an agriculture student usually labels them as a minority, whether they attend a predominantly white or predominantly minority college.

Even though there are more minorities enrolling, there is a current shortage of qualified minority people to work in agricultural careers (Talbert & Larke, 1995). Therefore, a serious effort must be placed on educating members of underrepresented groups about agriculture, if agriculture is to benefit from their diversity. Educational barriers and group perceptions are reasons for the low number of underrepresented groups pursuing careers in agriculture (Talbert, Larke, Jones, & Moore, 1997). Students who are enrolling in agriculture
have little or no first-hand farm experiences and are from urban, non-farm backgrounds (Garkovich, Bunch, & Davis, 1992; Fog, 1980). If agriculture is to benefit from their diversity, early exposure and participation in 4-H, FFA, internships, and other agriculture-related activities can increase the number of minorities attending institutions of higher education and obtaining agriculture career positions. As a result of these types of exposure, more minority students would learn about the various opportunities in agriculture-related areas.

To overcome differences in residential backgrounds, urban aspects of agriculture may be emphasized to help in recruiting minority students into agriscience education. Recruiting urban minority students to rural life poses several challenges. In a study conducted at Texas A & M University, students suggested that faculty and staff members were insensitive to cultures different from their own (Talbert et al., 1997). Minority students attending predominately white institutions, come from an array of different backgrounds thus requiring them to make major adjustments to their new social and cultural environments. For example, the majority of the African-American undergraduate students at Iowa State University come from urban areas. The state of Illinois, accounts for 1367 students, the largest numbers of students per state (The Office of Institutional Research, ISU 2001).

To be truly diverse, campus and communities must provide opportunities and conditions conducive to learning for anyone at all times. Being able to take care of one’s personal needs such as going to an African-American beauty salon becomes a challenge within itself. Only one African-American barber and no African-American beauty salon is available to minorities in Ames, Iowa. Therefore, women must drive to Des Moines, Iowa, about forty-five minutes away to have their personal hair care needs met. No radio stations,
restaurants, or museums are present to captivate minority audiences. Throughout the academic year, Iowa State University and the Ames community arrange some cultural programs or events, but there is nothing available during the summer school period.

Agricultural Youth Programs

In the United States there are educational programs that focus on both youth and agriculture. Two examples are the FFA Organization and the 4-H program (http://www.ffa.org; http://www.fourhcouncil.edu). Through agricultural education, youth develop leadership and personal development skills as well as receive academic and career guidance. However, the number of agriculture educators at the secondary level who would provide these services is diminishing.

Beginning in 1902, the 4-H program is the oldest youth agriculture program in the United States. Originally, the club assisted boys with growing crops, such as corn, while girls learned food presentation, such as canning tomatoes. In 1999, the 4-H organization was comprised of over 6 million youth in the United States, with more than 28% accounted for minority memberships. It offered a plethora of educational opportunities for both boys and girls. Now the organization is represented with 52% girls and only 48% boys.

The Future Farmers of America changed its name in 1988 to the National FFA Organization, encompassing the vast diversity of agricultural opportunities for today’s youth. For example, students have the opportunity to participate in Career Development Events (CDE). These events allow students to learn about careers within a classroom setting. Students with a global interest can participate in the FFA Global program. This program increases awareness of agriculture education in other countries and also provides students
with international experiences. PALS is a mentoring program that matches high school agriculture students with elementary students with special needs. While mentoring, students are also learning about agriculture and building lasting relationships. All of these programs represent only a few of the many agricultural activities available to FFA members (http://www.ffa.org/).

There are over 400,000 members in the United States ranging in age from 12 to 21 years that are eligible to participate if enrolled in agricultural education programs (http://www.ffa.org/). Early exposure to FFA and 4-H programs can help increase minority numbers within the organizations as well as vocational agriculture programs.

**Historical Perspective**

According to the FFA, in 1998, 64% of qualified agriculture education graduates became teachers, but fifty-five (55) agriculture programs closed due to the inability to find qualified teachers (http://www.ffa.org/). Over 11,000 agriculture teachers educate youth about agriscience, biotechnology, agricultural mechanics, horticulture, animal science, and environmental-related areas on a daily basis (http://www.ffa.org/). However the lack of teachers in agricultural education and FFA remains a challenge. If programs continue to close at the secondary level, it may become even harder to recruit young people to agriculture-related majors in college. It is possible that the low number of teachers can be associated with low wages, long hours of teaching, grading papers, and assisting with afterschool clubs and organizations. Therefore, new ways must be developed to attract professionals into teaching secondary education. Lack of exposure and awareness to agriculture programs will inhibit students from enrolling in such programs.
The recruiting and retention of minority students into traditional university agriculture programs is becoming a concern. Some minority students are reluctant to enter the field of agriculture due to the traditional image it once portrayed. The image of agriculture may be "perceived" or "real" to minority students (Larke, 1987; White, 1988). Hunte (1992) reminds us how slavery provided an entirely different agricultural orientation for minorities, especially African-Americans. Hispanic students can also relate to the unfavorable image of agriculture, due to the stereotypes of migrant farming (Reed & Flores, 1987). Minorities' negative perceptions of agriculture are still prevalent today through various stereotypes related to farming, limited socioeconomic status, and low wages (Bowen, 1987; Hunte, 1992; Larke & Barr, 1987).

To change these stereotypes, education systems at the primary and secondary levels, as well as colleges and universities along with communities, must begin exposing students to agriculture-related programs and to become familiar with the positive aspects associated with agriculture. One such aspect is the use of positive role models. For instance, George W. Carver, who was the first African-American to graduate from ISU and later held a faculty position in agriculture at ISU, serves as an excellent role model for minorities. He became one of the most prominent scientists and educators of our society and is best known for his numerous inventions with sweet potatoes and peanuts.

Changing Trends and The Future of Agriculture

At one time, the typical make-up of agriculture majors consisted of white males who had been raised on family farms. Now, even the typical agriculture student has changed. There are now more students enrolling in agriculture, who come from non-farm backgrounds
with little or no first-hand farm experience (Fog, 1980). In 1983, according to the United States Department of Agriculture, about 17% of youth lived on farms (USDA, 1983). In 1999, the number of students with a farm background decreased to 11%. Over 24% of students with an agriculture interest in 4-H are from central cities over 50,000. Of the FFA members, 27% live on rural farms, while 39% live in rural non-farm areas and 34% urban areas.

These situations clearly point to an urgent need to educate urban area students with agriculture curricula (White, 1988). To focus on agriculture in urban settings, almost fifty urban agriculture high schools now exist throughout the United States. Students have the opportunity to learn about various agriculture majors, issues, and career choices as they matriculate through high school. These schools introduce agriculture to urban students and prepare them for enrollment in post-secondary education and majoring in agriculture-related subject areas. In the Midwest, for example, the Agriculture Minority Summer Research Internship Program has recruited several students from the Chicago High School for Agriculture Sciences, located in Chicago, Illinois. Students have participated in the internship program as well as enrolled in undergraduate education at Iowa State University.

Approximately seven years ago (1994-95), an African-American student from the Chicago High School was nominated and elected the National FFA President. This student was the first African American and minority to serve as president. Prior to this occasion, other African Americans have held the National FFA Vice-President position in 1973-74, 1982-83 and the National FFA Secretary position in 1985-86. These individuals are role models for other minorities involved in this organization are an example of what leadership roles minorities can hold and change tradition. If more minorities get involved, they have a
better chance of increasing numbers and creating awareness of the opportunities available for minorities in agriculture.

To prepare for minority students, universities must develop intense, goal-oriented agriculture programs to attract underrepresented groups to the field of agriculture. By 2025, minority groups are expected to account for over 50% of the overall United States population, with Hispanics accounting for 18% of the United States population. Hispanics already account for the largest minority ethnic groups in states such as California and Texas (AmeriStat, 2001).

College of Agriculture, Iowa State University

According to Gerald Klonglan, (past Associate Dean of the College of Agriculture) a national call for diversity existed in the 1980s and the College of Agriculture at Iowa State University (ISU) created an initiative to increase diversity awareness. A group was formed to collaborate on ideas and programs relating to diversity. This information was then introduced as part of the college’s strategic plan. The group chosen to work on this effort consisted of Gerald Klonglan (Associate Dean of the College of Agriculture), Max Rothchild (then Assistant Director of the Agriculture Experiment Station), Tom Fretz (then Associate Dean of the Experiment Station), Detroit Green (Associate Dean for Teaching), and Dave Topel (past Dean for the College of Agriculture and committee chair). The College of Agriculture provided funding of about $200,000 allocated for research activities, faculty exchanges, graduate and undergraduate student research assistantships, a position for the Director of Minority Programs, and other resources needed relating to diversity.
Shortly after the need to involve individuals from underrepresented groups was determined, a “minority student program” committee was formed with representatives from various departments within the college. Activities focused on recruitment and retention of minority students (Rule, 2001). Later, the college formed a diversity committee but did not organize a formal meeting until 1998. Today this committee includes a faculty representative from each of the seventeen departments within the College of Agriculture. The committee continues to increase diversity awareness within the departments by informing its faculty of programs such as the Agriculture Minority Program, seminars, training, etc. within the College or campus wide.

Today, the Iowa State University College of Agriculture is committed to the development of diversity programs focusing on research and extension, particularly in collaboration with 1890 (Historically Black Colleges and Universities-HBCUs), 1994 (Tribal Colleges) and Hispanic-Serving land grant institutions.

The college has focused on increasing diversity by incorporating the following programs (Agriculture Diversity Programs, 2001):

1. Agriculture Minority Summer Research Internship Program
2. Experiment Station Diversity Graduate Research Assistantship Match
3. Faculty Research Exchange Visits
4. Linkages with 1890, 1994, and Hispanic Serving Land-grant Institutions
5. Special Activities

Listed below are detailed descriptions relating to each program:

(1) The college supports a six-week research internship for high school students and an eight-week internship for undergraduate students as part of its diversity recruitment strategy. Students are matched with faculty members to conduct research in their areas of interest. To date, 94 students have participated in the summer internship program since 1994.
The Experiment Station provides a quarter time graduate assistantship for minority students when matched by departments. Since 1993, the Experiment Station has supported 56 students studying in 15 departments in the College of Agriculture. Graduate students have conducted research in their prospective areas.

Another program aims to strengthen the research linkages of ISU faculty and their counterparts at 1890, 1994, and Hispanic serving land-grant institutions. As a result of exchanges, collaborative grants have been written, undergraduate and graduate recruitment has increased, and student and faculty exchanges have taken place.

Iowa State has partnered with 1890 and 1994 land-grant institutions on several collaborative grants. Collaborators include Tuskegee University, Alabama A & M, North Carolina A & T, University of Maryland Eastern Shore, Crownpoint Institute of Technology, Haskell Indian Nations University, Oglala Lakota College, La Courte Orielles Ojibwa Community College, and Si Tanka Community College.

Special activities have occurred with administrative visits and partnerships with agribusinesses. Iowa State University hosted the National Minorities in Agriculture, Natural Resources, and Related Sciences (MANNRS) Conference in 1998. The college continues to support the conference by assisting faculty and student attendance. Other collaborations include the dedication services of the USDA George Washington Carver Center in Beltsville, Maryland in 1999. The college also hosted the North Central Joint Meeting of Land Grant agricultural administrators in July 2000.

All of these programs support the College of Agriculture at Iowa State University's commitment to diversity programming. The college continues to focus on ways to enhance diversity programming (Agriculture Diversity Programs, 2001).

In the mid 1990s, ISU began partnering with 1890 land-grant universities (Historically Black Colleges and Universities) to increase the number of minorities enrolling in the College of Agriculture. A program was developed to provide opportunities for minority students to conduct research under the guidance of ISU faculty members, and also allowed students to become familiar with the campus and the surrounding community. Recently, partnerships have also been developed with the 1994 Tribal Institutions. These land-grant colleges were established to assist Native Americans with formal education programs in agriculture and related fields of study.
Iowa State University, Virginia Polytechnic Institute and State University, Texas A&M University, Michigan State University, and several other universities have developed programs to specifically recruit and retain minority students in the field of agriculture. Another example of a pre-college program is Southern University’s Beginning Agricultural Youth Opportunity Unlimited (BAYOU) Phase I, which focuses on attracting academically-talented high school youth into food and agricultural science-related careers (Rawls, Martin, Negatu, & Robertson, 1994). These programs introduce agriculture to high school and undergraduate aged students.

In recruitment and retention programs, like those mentioned above, it is imperative that minority faculty and staff serve as mentors and advocates for these students. It is imperative that students see other persons who look like themselves in agriculture-related positions. The minority faculty and staff mentors are reflections of their mentees and have gone through some of the same struggles and challenges. They can provide guidance to the students as they aspire to choose a career path. Non-minority faculty members can also serve as role models. However, they may have difficulty relating to the minority student’s background, economic challenges, and cultural identity. Minority faculty and staff can assist students with career choices, offer advice on agriculture and related majors, as well as provide students with moral support during the course of the internship because they are more likely to relate with the minority students’ cultural identity.

Agriculture Minority Summer Research Internship Program, Iowa State University

In 1993, Iowa State University’s College of Agriculture initiated the “Minority Apprenticeship Program” under the direction of Charanne Parks, former Director of
Agriculture Minority Programs, and Dawn Mellion-Patin, a former graduate assistant for Agriculture Minority Programs. In 1995, the program became known as the Agriculture Minority Summer Research Internship Program. Since that time, Timika Gray and Nicole’ Gale have served as graduate assistants in coordinating the summer program. Nina Grant, who joined ISU-College of Agriculture as the new minority liaison officer, currently serves as the Director of Agriculture Minority Program and has been with the program since 1998.

Inviting students to attend the ISU Agriculture Minority Summer Research Internship Program provides a means for students to become familiar with the campus and academic programs. Hopefully, this will lead to the desire to attend ISU for their undergraduate or graduate degree. The internship program is a six-week research experience for high school aged students and an eight-week research experience for college undergraduates. The beginning of the high school internship program was determined based on the conclusion of the academic school year. High school students usually end their academic semesters later than colleges and universities, therefore the program begins two weeks after the end of the regular high school academic year. Although the internship is one program, it serves both high school students and undergraduate students in the same summer program.

To stay competitive with other institutions, a stipend is offered as an incentive for participating students. They can use the money towards their college education. High school students receive a stipend of $1500 and the undergraduates receive $2240. Faculty members who serve as mentors are expected to provide the remaining half of the stipend, $750 and $1120, respectively.

Students are matched with a faculty mentor within one of the 17 agriculture departments at Iowa State University to conduct research in an agriculture-related area of
interest. Faculty members are notified about the program during Diversity Committee meetings and applications are then distributed to each department within the College of Agriculture and the College of Family and Consumer Sciences. Faculty members then make final selections of students they would be interested in mentoring for the summer. During the internship, students engage in research on a faculty-led team, which may include current graduate and undergraduate students from Iowa State University.

In addition to research, the interns participate in weekly seminars, cultural, educational, and social activities. These additional activities are provided to introduce the students to other agriculture activities within the state of Iowa. The social activities allow students to build bonds in a family-like atmosphere. At the conclusion of the program, each student is required to submit a final report and make an oral presentation based on his/her research conducted over the course of the internship program. At this time, the internship program does not give college credits to students for participating. However, the decision to accept the summer internship for college credit is decided by the student's home institution. Students are provided with airfare, room and board, cost of social activities, etc. averaging about $5,000 per student. Most of the monies for this program are allocated through a diversity fund in the Agriculture and Home Economics Experiment Station budget.

To date, 94 students have participated in the internship program from various locations throughout the United States. Students must be at least 16 years of age or older, be classified as domestic minorities (African-Americans, Asian-American/Pacific Islanders, Latinos/Hispanic-Americans, Native-Americans/American Indians), and be United States citizens or permanent residents to participate in the program. These are the same criteria Iowa State University uses to classify all minority students. International students and white
females are not included in this definition of minority. Some students possess an array of knowledge relating to their areas of interest and others are just curious about agriculture and the chosen subject matter.

Programs such as this one allow students to explore areas of interest and to assess the various departments and the Iowa State University campus environment for possible undergraduate or graduate study. Students not only receive a tour of the campus given by other minority students, but also have the opportunity to experience living in the residence halls, working with other students and faculty members, and reviewing curricula. It is important to make the student’s experiences at Iowa State University a productive and enjoyable one. The internship teaches the students how to balance academic rigor and social activities. Students are responsible for utilizing time management skills and working independently as well as collectively to complete necessary projects.

Faculty members also have the chance to introduce students to future agriculture studies and some have inspired students to consider Iowa State University for graduate and/or undergraduate programs. The faculty/student relationship can be vital to the student overall success and matriculation in a degree granting program. Before students arrive, the graduate assistant conducts a training session for the faculty mentors. This allows faculty to have questions addressed face-to-face. Faculty members receive a summer schedule of all intern activities and are encouraged to participate along with their staff. Weekly emails are sent to faculty members as a reminder of on-going activities. The program aims to thoroughly prepare the faculty, staff, and students for participating in the internship program.

Faculty has served as mentors since the beginning of the AMSRIP. Mentors have participated in various departments within the College of Agriculture and the College of
Family and Consumer Sciences. Since 1998, 67 faculty members have participated in the AMSRIP as mentors. Although only sixty students have participated in the AMSRIP, some students are sponsored by more than one faculty member. Eleven of these mentors have participated more than once. These mentors have assisted students with conducting research and preparing research papers. One student had the opportunity to present their research internship paper at a sociological research conference last year. Another student served as a co-author in a research journal article. Some of the Tribal College interns developed distance education courses for their home institutions and now those actual on-line courses are being utilized. All of these experiences allow students to understand how their research is making an impact within their respected fields.
Statement of the Problem

Early intervention programs are designed to inform underrepresented groups about agriculture. To increase enrollment within agriculture, minorities must become aware of vast numbers of high status agricultural career opportunities (Hunte, 1992).

Since 1994, the College of Agriculture at Iowa State University has coordinated a summer research internship program for minority students from across the United States of America. Ninety-four (94) students have participated in the program over the past six years. As participants, students gain a number of new experiences through their total immersion in this internship program, encompassing all experiences including research, academic, or social activities. The goals of both the College of Agriculture and the Office of Agriculture Minority Programs, regarding effective programs to recruit and retain minority students gave birth to the major focus of this study. This research aims to assess the effectiveness of the Agriculture Minority Summer Internship Program as a recruitment and retention tool.

The study also attempts to clarify what effect the Agriculture Minority Summer Research Internship program had, if any, on career choices of its participants. To examine this internship program, it is imperative to examine the purpose, goals, and objectives that have gone into the development of this program. In collaboration with the College of Agriculture Administration and Agriculture Minority Programs, research was needed to examine the factors that contributed to the overall effectiveness of the Agriculture Minority Summer Research Internship Program.
Purpose and Objectives

The primary purpose of this study was to evaluate the impact of the experiences high school and undergraduate students received while attending Iowa State University's Agriculture Minority Summer Research Internship Program. The specific objectives of the study were:

1. To determine the factors that influence participants to apply for the program.
2. To understand if the students' expectations were met or exceeded.
3. To identify key factors that influenced students not to major in agriculture.
4. To determine if program characteristics and demographic variables influenced the learning experience.
5. To identify students' perceptions regarding the usefulness of the research internship program in contributing to their future career and college major selection, and
6. To identify factors that enhanced or inhibited minority student recruitment and retention at Iowa State University within the College of Agriculture.
Significance of the Problem

This study, the first of its kind in Agriculture Minority Programs at Iowa State University, provides data on the impact of the Agriculture Minority Summer Research Internship Program since its beginnings in 1994. It provides information regarding the number of minority students enrolled in agriculture and those currently attending Iowa State University. In addition, this study tracks former interns and those who have graduated and are working in agriculture-related occupations. In short, it serves as one evaluation tool for assessing the effectiveness of the internship program.

The College of Agriculture’s diversity committee may use the data and information from this study to apply for funding grants, for staff support, and for faculty interested in working with the internship program. Results will be used to make improvements to the Agriculture Minority Summer Research Internship Program and assist in designing other diversity-related programs. This study will provide an insight for future program planning for the College of Agriculture and Agriculture Minority Programs and may also help predict future minority recruitment and retention within the College of Agriculture.

Additionally, this program serves as a model for internship programs in other colleges at Iowa State University as well as other institutions. For example, the College of Engineering at Iowa State University asked to participate in the Agriculture Minority Summer Research Internship program and was included on the Summer 2001 applications (Iowa State University Agriculture Minority Programs, 2000). As the program increases in numbers, it is also building a reputation and future partnerships with new institutions.
Operational Definitions

For the purpose of this study, it is necessary to define some of the terms listed below in the context they were used throughout this research.

- **Diversity** represents differences with respect to age, ethnicity, socioeconomic status, race, gender, physical and mental abilities, sexual orientation, spiritual practice and human differences (Bowen, 1994).

- **Land-grant universities** are devoted to educating the common people about agricultural issues. Today at least one college in each state is named a land-grant institution, offering courses in agriculture and mechanic arts (Seevers, Graham, Gamon, & Conklin, 1997).

- **Internship** refers to the paid summer research experience for high school or undergraduate students at Iowa State University.

- **Minorities** are individuals from underrepresented ethnic groups such as African-Americans, Asian-American/Pacific Islanders, Latinos/Hispanic-Americans, Native-Americans/American Indians.

- **Perceptions** are the act of insight or intuition by means of the senses, awareness or comprehension (Merriam-Webster On-line Dictionary, 2002).

- **Program characteristics** refers to specific information relating to the activities and program structure of the Agriculture Minority Summer Research Internship Program at Iowa State University.
CHAPTER II. LITERATURE REVIEW

This literature review is divided into three major sections. Each section explains relevant theories and describes related research that will serve as the theoretical framework for this study. This literature review examines research related to the purpose of this study including experiential learning, recruiting strategies, retention methods, and career exploration as related to assisting minority interns with career choices in agriculture.

Experiential Learning and Internship Programs

I hear, and I forget;
See, and I remember;
I do, and I understand.

_Chinese Proverb_

The Chinese Proverb above represents the notion what experiential education tries to accomplish. It was David Kolb in 1984 who chose the expression “experiential learning” to link his ideas to the roots of work by Dewey, Lewin, and Piaget and to underscore the role of experience in the learning process. Experiential learning theory provides information that can be useful in measuring the effectiveness of educational programs (Evans, Forney, & Guido-DiBrito, 1998). This term experiential learning is also referred to as “learning by doing” (Conners & Mundt, 2001; Woffinden & Packham, 2001). Experiential education is a generic term, which describes a wide variety of learning situations outside the classroom (Garkovich, Bunch, & Davis, 1992). Miller (2001) states that experiential learning serves as the link between the classroom and the real world. A number of school-to-work (STW), education-to-work (ETW), and experiential education programs have been developed to help
students gain understanding and knowledge by working and learning simultaneously. Conners and Mundt (2001) reported that agricultural education programs have involved students working with gardens and farms since the early 1900s.

Apprenticeship is another term for experiential learning programs or internships. Apprenticeships represent one of the oldest approaches for transferring knowledge and/or skills from one to another (Agnew & Cole, 2001). Experience-based education is used as a method of instruction in many colleges and universities across the nation (Kolb, 1984).

Experiential learning programs can take on many characteristics. Students may be required to do experiential learning programs as part of a class project or to fulfill the necessary graduation requirements. This is usually decided upon before the start of the experiential learning program. It is imperative that students obtain as much information as possible about their prospective placement prior to beginning their internships. This prepares the student for the type of duties necessary to perform a certain job. Students may be placed in a wide variety of settings. For example, students can work in agribusiness, county extension offices, international programs, research labs, or on a farm. Academic credit and salary may or may not be provided. Internship in the context of this paper refers to the paid experiential learning experience for high school or undergraduate students in the Agriculture Minority Summer Research Internship Program.

According to Kolb (1984), “The Experiential Learning Model is a process that links education, personal development, and work together.” (Figure 1.) All of these components are necessary and should be included if experiential learning is to take place.
Experiential learning, according to Carl Rogers (1983), allows individuals to contribute personal involvement in his/her learning process. The whole person concept allows learners to focus utilizing feelings, concepts, intellectual ideas and meanings, evaluated by the learner. Rogers contends that the educational system has moved away from programmed education. However, in agriculture education classrooms, programmed or systematic education still exists.

In agriculture education, at the secondary level, supervised agriculture experience (SAE) programs are used as agricultural education’s application of experiential learning (Martin, 2001). An SAE program is a planned practical agricultural activity, which supports skill and competency development, and career success and application of specific agricultural academic skills a student has learned through classroom instruction in agricultural education. Agricultural education program teachings are based on the Agricultural Education Philosophy. This traditional interconnected model consists of three circles, (Figure 2), (Conners & Mundt, 2001; Keith, 2001). Agricultural education
teachers, in cooperation with parents, employers, and other adults, supervise students in the development and achievement of their educational and career goals (http://www.ffa.org/programs/sae/index.html).

Peterson, Marzolf, and Hinrichs (2001) provide an approach to experiential learning for the 21st century. At Forest Lake High School, Forest Lake, Minnesota, students are required to have a SAE. About 1200 students per year undergo such an experience. Students begin discussing projects as early as the first week of classes. They also receive a copy of the SAE Project Outline and the SAE Project Plan. During this experiential learning/SAE students work a minimum of ten hours outside the classroom. At the end of the SAE project, students are expected to present their projects (Peterson et al., 2001). These SAEs allow the students to apply the knowledge and skills they have acquired in the classroom and demonstrate them while obtaining on the job skills.
Recent literature questions if SAEs are meeting the needs of today's students. All agriculture education programs are not required to have SAE. However, some instructors have the option of including a SAE into their curricula (Peterson et al., 2001). Keith (2001) stated local instruction, along with support and resources, depends on whether or not the SAEs are meeting the needs of today's agricultural education students.

An internship program may be the means by which the student can bridge the gap between classroom teaching and actual work experience (Fog, 1980). John Dewey (1938) stressed the importance of using life experiences as a scientific approach to learning. Dewey's concept of life-long learning is still very prominent today. These internship experiences allow students the opportunity to have a hands-on approach to learning. For example, some interns work in laboratories, while others work outside, collecting water samples from local rivers; thus, both students are gathering data for conducting research.

Everyone has different ways of comprehending; each individual has different learning styles. Galbraith (1991) states that learning styles are ways individuals prefer to engage and process information in learning activities. Teaching and learning atmospheres must provide a variety of activities to accommodate a variety of learning styles. For example, the activities could include hands-on, visual, and individual or group assignments.

As a part of the Agriculture Minority Summer Research internship program, students are required to conduct research during their internship experience. Other programs, like the Ronald E. McNair program, also encourage undergraduates to become involved with research early on in their academic careers. The Ronald E. McNair program, named after one of the first African-American astronauts, is a comprehensive graduate school preparation program designed for low-income and first generation undergraduate students and those who
are traditionally underrepresented in graduate education (Jackson, 2000). A faculty mentor is assigned to assist the undergraduate student with his/her research experience. These undergraduate research internships can also be a tool for recruiting students into graduate programs (Woirhaye & Menkhaus, 1996). Exposure to research at the undergraduate level also prepares minority students for future faculty positions.

In order for an internship program to be successful, Fog (1980) states that three essential items are needed:

1. An administration that believes in the worth of the program. It must be willing to commit financial resources necessary for success.
2. A faculty supportive of the work experience program and willing to accept the responsibilities involved, direct students, and provide advice, assist in planning, supervision, and evaluation.
3. Employers willing to provide a real educational experience for students.

Located below are some examples of how Iowa State University has made a commitment to the Agriculture Minority Summer Research Internship Program.

(1) The College of Agriculture at Iowa State University has made this financial commitment since 1993. The Agriculture Experiment Station as well as departments and individual professors also contribute financially to support individuals. Originally about $200,000 was allocated for diversity programming and currently about $350,000 is spent in this area. These figures include the AMSRIP, assistantships for graduate research, and the Agriculture Minority Program budget.

(2) Faculty serve as mentors and also involve departments and other undergraduate and graduate students to work with interns. Thus far 67 faculty mentors have served as mentors in the AMSRIP. They also assist students in the completion of their research papers and oral presentations.

(3) During the internship program, interns are assigned to work in laboratories, hog farms, and even conduct library research. Their research is usually a small part of a larger research project.

Recruitment of Minority Students

How can competitive minority students be persuaded to attend college and major in agriculture? College and university admission recruiters are faced with this very question.
Stating well-known historical facts about the institution or bragging on the institution's outstanding sports reputation or simply speaking about the educational ranking of the various departments within the institution are certainly not enough. While this information may be valuable to some, for others the information alone may not be the sole determining factor to attend a particular institution.

During the 1980s, student enrollments declined in the colleges of agriculture (Champney & Myer, 1990). According to Talbert and Larke (1995), there is a current and future shortage of qualified people to work in agricultural careers. Maintaining viable and consistent student numbers in Colleges of Agriculture over the past ten to fifteen years has become challenging in many states (McCarthy, 1994). Educational barriers and group perceptions are attributed to the low number of underrepresented groups pursuing careers in agriculture (Talbert, Larke, Jones, & Moore, 1997). The students who are enrolling in agriculture typically have little or no farm experience and are from urban areas (Garkovich, Bunch, & Davis, 1992). Therefore, serious efforts must be placed on educating underrepresented groups about agriculture, if minorities are to become a viable force in this sector.

To overcome differences in residential backgrounds, urban aspects of agriculture may be emphasized to help in recruiting minority students into agriscience education. Urban agriculture refers to activities promoting the improvement of the city dweller by providing food and plants (Jones, 1978). Therefore new recruiting initiatives focus on urban population and non-traditional students (McCarthy, 1994).

Minority students come from an array of different backgrounds. For minority students attending predominately white institutions, they are required to make adjustments
including adaptation socially and culturally to a new environment. In a study conducted at Texas A & M University, students suggested that faculty and staff members were insensitive to cultures different from their own (Talbert, Larke, Jones, & Moore, 1997). It is essential for minority students to feel appreciated at an institution; a supportive atmosphere must exist. Providing a safe, friendly, receptive and caring environment where students are nurtured and developed academically is essential (Cole & Thompson, 1999; Larke, 1987).

According to DelCampo (1996), “Acculturation is described as a process whereby ethnic minorities learn, incorporate, and integrate characteristics of the dominant culture into their lifestyles.” However, if campuses and communities are truly becoming diverse, everyone must learn from each other.

While the numbers of undergraduate students recruited to (ISU) has been on the increase, the number of undergraduates within the College of Agriculture has declined. During the 2000-2001 year, 2,758 were enrolled as undergraduates, down 130 students from the previous year. However, the minority student numbers have risen to 115 minority students enrolled in the College of Agriculture, 9 students more than the previous year (Iowa State University, College of Agriculture, 2001). These numbers reflect successful attempts to increase diversity within the Iowa State University College of Agriculture. Agriculture Minority Programs received a $2,455 Professional & Scientific Recruiting and Retention Grant to recruit minority interns within the state of Iowa. Visits were made to local high schools advertising the summer research internship program. An objective of the program was to encourage high school students to consider Iowa State University for undergraduate education. As a result of 2000’s internship program, 3 new minority high school students
were accepted and attended Iowa State University in the Fall 2001 academic semester. These students represent the states of Iowa, Illinois, and Minnesota.

In the early 1980s, Reisch (1984) described plans carried out for recruiting students to The Ohio State University's Agriculture Program. They developed an Agriculture Ambassadors Program, provided agriculture information for High School Career and Job Fairs, and participated in an Agriculture Day, Science Expos, and organized Urban High School Guidance Counselor Lunch meetings. All these activities have increased exposure to the agriculture program for that institution. However, Mosley (1987) indicated that agriculture colleges should actively promote their programs but should not organize aggressive campaigns to persuade students to choose agriculture over other majors.

Cole and Thompson (1999) suggested that agricultural colleges should recruit potential students from high school agricultural education and 4-H programs. Continued efforts to educate high school youth about agriculture are needed, which include making high school visits and on-campus visits, i.e., Experience Iowa State Days. This program was developed by the Iowa State University admissions office and allows perspective high school students and their parents to explore Iowa State University. Students have the opportunity to tour the campus and ask questions pertaining to academic and social life.

In literature distributed by the Iowa State University Enrollment Services (1999), first impressions make a difference in a student's selection of colleges to attend. Factors such as parking, friendly staff, faculty members and students, well-maintained campus, and knowledgeable and friendly advisors play a role in a student's college selection. During orientation, the agriculture minority staff is available to meet and greet prospective students and their family members. The next morning they are invited to attend a minority breakfast.
This allows students to meet other minority students within the college and ask specific questions relating to Iowa State University. Students usually ask, "Where should I live on campus?", "What extra-curricular activities are available?" and "Are tutors available to help with classes?" The staff also encourages students to enroll in the Agriculture Minorities Empowered for Success (AMES) Learning Community and Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS). Individual appointments can also be made with college for on-campus visits.

A study at Clemson University Department of Horticulture, initiated a student recruiting program in 1982 (Haque, 1985). Students were given the chance to articulate their academic experiences to other potential students, while visiting their former high schools and make presentations about their universities. Haque also found this approach of recruiting maximized student learning through involvement, allowed faculty to devote more time to research, teaching, and extension duties as well as reduced departmental spending on recruiting efforts. Haque states research has indicated that students are more likely to listen to a peer than a distinguished faculty member. When recruiting minorities, it would be helpful to have other minority undergraduate students who are currently enrolled at the institution. This allows potential students to interact with those who have had similar experiences and can relate to being a minority and attending a predominately white institution. Undergraduates also have a better understanding of student life, academically and socially, than faculty members. The upper-class undergraduate students can also serve as role models for incoming students.

In 1987, faculty in the College of Agricultural Sciences at Clemson University began making high school visits and presenting information about the college. Faculty members
usually presented during science classes and informed students about agriculture majors such as Food Science, Dairy Science, Entomology, and Agronomy. As a result of these in-class presentations, the freshman enrollment within the college was 100% greater than the prior year (Richardson & Skelton, 1991). Since students involved in the presentation were in grades 9-12, they were potential students for the next few years.

The ISU Agriculture Ambassadors program is very similar to that of Clemson University. This volunteer program allows about twenty undergraduate students to recruit for ISU at their former high schools during the university breaks. Students discuss and provide literature on ISU as well as share their personal experiences. Students also assist with providing campus tours to prospective students and their families. Career field days and the annual Agriculture Day for kids allow students to educate primary and secondary students about agriculture (Polito, 2002).

Lack of monetary commitment for student recruitment may also reflect a lack of commitment by university administration for student recruitment (Pescatore & Harter-Dennis, 1987). Scholarships, grants, and financial aid are essential to recruit, retain, and graduate students, especially those of underrepresented populations who may already be economically disadvantaged. Tuition, books, and other school supplies are costly and students oftentimes forget to include personal items such as food, housing, and clothing into their financial planning for college. To assist with some of these additional costs, federal work-study or part-time employment may be necessary, but can take away study time.

A student's decision to attend a particular institution is influenced by many factors such as parents, alumni, teachers/counselors, and other students. Larke (1987) stated that minority alumni are a valuable asset in the recruitment and retention cycle, especially if their
college experiences were favorable. Alumni can inform students of their personal experiences, likes and perhaps dislikes, as they matriculated at a particular institution.

**Recruitment Model for Underrepresented Populations**

Recruitment efforts are essential in reaching underrepresented groups to attend post secondary education and major in agriculture-related areas. To address this concern, a model for recruitment of students from underrepresented populations was developed (Talbert, Larke, Jr., Jones, and Moore, 1997). See Figure 3.

![Figure 3. Model for recruitment of students from underrepresented populations.](image)

This model uses seven items to represent what is needed at a university to recruit minority students. To interest students in applying to a particular university, personal faculty contact is needed. Faculty members can provide guidance and offer advice on the university.
In order to assure that the student will be able to afford the costs of the university, financial support must be available, especially for out of state minority students. On-campus housing would serve as a plus because students would be able to meet others from underrepresented groups, international and white students living in the residence houses. As minority students are becoming familiar with their new environment, faculty should encourage them to find upper-class students to act as mentors and provide a positive image of agriculture and the opportunities available through career exploration and field trips. All of these components are necessary to have in place before recruiting minority students to a particular university.

Retention of Minority Students

Mokma, Houston, and Zimmerman (1991) stated that it is not merely enough to recruit students, but even more essential to retain them. In the context of this paper, retention refers to the former AMSRIP interns who were recruited to ISU for undergraduate or graduate degrees. The intent of Agriculture Minority programs is to assist in retaining these students until they successfully complete degree requirements and graduate with their degrees. Retention of these students allows the program to account for success of the AMSRIP. It may be difficult to retain students based on their acceptance to the university and the surrounding community, financial, and academic stability. Retention of these minority students at ISU and in agriculture-related majors allows the college and the society at large to benefit. Therefore this increases the number of minorities with degrees in agriculture-related areas and who will possibly serve as agriculture professionals or future faculty.
In their study at The Ohio State University Agricultural Technical Institute, they discussed how an orientation course was developed to assist in retaining students. The course focused on preparing the student for a successful college career. Throughout this required course, students utilized journals to write about their experiences and express their feelings. Writing in the journals alerted the professor to problems or conflicts an individual may be having and allowed the professor to focus on the problem before it became a broader issue.

Retention consists of institutions providing a receptive campus and community environment, contact with faculty and availability of financial aid (Relsch, 1984). Without these things present, students would probably not succeed at attaining higher education. Financial support can have a direct effect on student retention. It is imperative that recruiters and financial advisors discuss with students the options about financial aid and scholarships.

Brown and Cvancara (1991) conducted a survey of the College of Agriculture and Home Economics (CAHE) students at Washington State University and found that scholarships have an effect on the retention of students within a particular given college. Lewis (1994) also agrees that without financial incentives and support for individuals from underrepresented groups, higher education may not be attainable. Over 58% of the students remained in CAHE after receiving scholarships, while the other 42% had to drop-out or find other ways to finance their education if they lost their scholarships due to personal reasons or grade point averages.

According to a study conducted at Oregon State University, College of Agricultural Sciences, some students left the college or university due to changes in career, lack of financial resources, or students not being academically prepared for science-based curricula
(Cole & Fanno, 1999). The survey also found that students were more likely to remain if they had membership in student clubs and organizations or had prior backgrounds with 4-H and FFA programs (Cole & Fanno, 1999).

In 1982, Ag Partners was initiated at the University of Nebraska at Lincoln in the College of Agriculture to increase retention. This program was designed to enhance student opportunity to meet student groups and lower the attrition rate. Incoming freshmen were paired with an upper-class student who helped orient the student to college. As a result of this program, retention rates were slightly higher than those who chose not to participate in the study (Dodge & Rocker, 1986).

Improving student advising efforts was focused on in order to increase retention for freshman undergraduate students in the College of Agriculture at the University of Nevada-Reno. The college wanted to decrease dropout rates by encouraging advisors to be aware of student attendance, class performance, study habits, etc. Dropout rates for freshmen started at 71% in 1986 and then decreased to 40% in 1987. These figures indicate a definite decline; the key was to identify problems before they became a crisis (Champney & Myer, 1990).

The ISU Agriculture Minority Program Office has developed several ways to increase retention. For incoming minority freshmen and transfer students, the College of Agriculture has offered the option of enrolling in the Agriculture Minorities Empowered for Success (AMES) Learning Community. Since 1998, the Director of Agriculture Minority Programs has taught this one credit course every fall semester. To date, 22 students have participated in the 1-hour a week seminar course. Students are introduced to other minority students who are presently enrolled and who have attended the same course (Grant, 2001). In an effort to retain these students, the course discusses diversity issues and how minorities can succeed at
a predominantly white institution. For example, students discuss being the only minority in the class or how to address racial slurs. Thus far 19 students remain in the college, while 3 have left the College of Agriculture or Iowa State University.

The importance of having students become involved in departmental programs may also increase retention among undergraduate students. McCarthy (1994) discusses how at one institution all first quarter majors are placed in the Introduction to Agricultural Mechanization class. The course also encourages them to join the agricultural mechanization club as an extra-curricular activity. This allows students to meet other students within their major and build a sense of community.

Nina Grant, Director of the ISU Agriculture Minority Programs, teaches and arranges class time according to the students' schedules. Students are informed of other campus resources for minorities including Minority Student Affairs, given information on how to succeed in college, selecting advisors, and other related academic and diversity information. In past semesters, students have visited the facilities at ISU Veterinary Medical School and agricultural-related businesses, as they begin to prepare for possible agriculture careers. Students participated in these tours and were able to ask specific questions as they relate to future career goals.

Cole and Fanno (1999) stated, "a connectedness seems important to retaining students." Organizations such as Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) are critical in recruitment and retention of minority students. MANRRS began as a vision shared by a group of agriculture students and faculty members at Michigan State University (MSU) and Pennsylvania State University (PSU). Their goal was to develop a partnership between minority agriculture and natural resources students and
professionals from academic institutions, government, and industry. Their commitment led to the first national MANRRS conference, held at MSU in 1986 (MANRRS National Headquarters, Outreach Communications, 2001). MANRRS is a national organization that began in 1986 and now has over 1300 members, seeking to increase the number of minority students majoring in agriculture. This organization fosters a bond between minority faculty, staff and students, encouraging scholarly achievement, and promoting careers for academic, professional, and leadership development among minorities (http://www.manrrs.org/).

The Iowa State University chapter started in 1990, and is one of 40 chapters located in 29 states. Membership is composed of African-Americans, Latinos, Asian Americans, Native Americans, and Caucasian students and professionals. Students in the ISU chapter hosted the 1996 Regional Conference and the National MANRRS Conference in 1998, highlighting Dr. George Washington Carver, alumnus of Iowa State University-College of Agriculture and the first African American to attend and graduate from (ISU). Dr. Carver later taught at (ISU), becoming the first minority to do so.

The Iowa State University MANRRS Chapter has assisted students financially with attending past National MANRRS conferences. At the national conferences, undergraduate and graduate students attend workshops, attend a career fair and also have the opportunity to compete in research contests while networking with others. Students can also hold leadership positions. A former ISU student, Iowa native, and Agriculture Minority Intern, Charles Stewart served as the National Undergraduate President of MANRRS during the 1999-2000 academic year.

In the future more specialized programs are needed to increase the awareness of agriculture and agriculture-related majors and careers. This early exposure to agriculture will
increase minority numbers and prepare them for future faculty positions. The challenge to change the perceived or real image of agriculture still exits. Therefore, exposure to agriculture-related majors, courses, and career opportunities must be presented. McCarthy (1992) indicated that creative recruitment ideas must be developed, implemented, and periodically evaluated to ensure long-term program enrollment stability.

Retention Model for Underrepresented Populations

Retention efforts are necessary to retain underrepresented groups while they attend post secondary education and major in agriculture-related areas. To address this concern, a model for retention of students from underrepresented populations was developed (Talbert, Larke, Jr., Jones, and Moore, 1997). See Figure 4.

Figure 4. Model for retention of students from underrepresented populations.
The visible support is necessary to minority students. Minority students need to know that the administration, faculty, and other students will be available for support whether financial or social. Students may need part-time employment in addition to their financial aid to assist school-related costs. Students will also need social, recreational, and student club activities on weekends. These activities allow them to form friendships with others outside the classroom setting. As these students form bonds, mentor/mentee relationships can be developed to eliminate biases and create a positive image of minorities in agriculture. Recruiting is not enough, universities must also retain and graduate minority students in agriculture to increase the number of professional minorities.

Faculty and Staff Involvement in Retention

Once minority students enroll in programs, it is especially important that minority faculty and staff serve as mentors and advocates for these students. Student success in college can be attributed to the role faculty advisors play (DelCampo, Soto-Fulp, & DelCampo, 1996). It is also imperative that students see other persons who look like themselves in agriculture-related positions. These individuals are reflections of themselves and have gone through some of the same struggles and challenges. They can provide insight and guidance to the students as they aspire to choose a career path. Non-minority faculty members can also serve as role models; however, they may have some difficulty relating to the minority student’s background, economic challenges, and cultural identity. Minority faculty and staff can assist students with career choices, offer advice on agriculture and related majors and provide students with moral support during the course of the internship because they are more likely to relate with the students’ cultural identity.
Verdugo (1995) states "role models are roles filled by individuals with certain levels of status and /or power which we want others to emulate." With having underrepresented faculty and staff in positions of higher education, minority students are then motivated to achieve academically and remain in school. These individuals provide a safe haven for students in a time of need.

Figure 5. The Minority Liaison Officer Model
As a way to incorporate faculty and staff in the retention of minority students a model at ISU was developed. In the 1990s, George Jackson proposed the adoption of the Minority Liaison Officer Model (MLO) to Iowa State University. This model required deans and faculties to design a learning environment valuing diversity (Figure 3). The success of this model depended on Predominantly White Institutions (PWIs) taking a proactive role in working with minority students, especially in terms of recruitment and retention (Jackson, in press).

The initial intent was the vision of the ISU President to make a more inclusive environment on campus for minority students. Then the idea of increasing underrepresented ethnic students and staff to enhance the diversity of the university would need to include the support of the administration, faculty, and staff. Financial assistance was also allocated for retention and each college would have a MLO and a contact office. This model has been adopted and is currently used on the campus of Iowa State University. Each one of the six colleges listed above has a MLO. This is a minority staff person who is responsible for some recruitment and retention of minority students within their college. These offices provide academic assistance, social activities, and personal counseling to assist minority students. Overall this model has proven to be a success in the number of minorities being retained in each college as well as the university at large.

Gardner (1991) suggested the following activities to increase retention of minority students:

1. Maintain contact and communication with students throughout their high school years. Contact can include but not limited to letter writing, campus visits, and high school visits.
2. Meet with college students on a regular basis to facilitate long-term planning and to assist in academic scheduling; monitoring academic progress.

3. Develop a mentoring program-matching freshman with upper-classmen.

These suggestions are important to consider in assisting minority students with retention. Faculty members must have a genuine interest in the students' academic preparation. Communication is viable to establish and maintain a relationship with faculty mentors.

As a part of the ISU Agriculture Minority Summer Research Internship Program, faculty members have the chance to serve as role models for prospective undergraduate and graduate students. These students benefit from summer contacts within the departments and other graduate students. Faculty mentors must provide students with clear expectations, feedback and constructive criticism (Woirhaye & Menkhaus, 1996). By incorporating these retention activities, students are more likely to be recruited, retained, and graduated with a bachelor's degree (Gardner, 1991).

Career Exploration

Recruiting and retention of minority students into traditional university agriculture programs are challenging. Recruitment of minority students for career opportunities in agriculture and related disciplines has historically been a difficult challenge (Gardner, 1991; McCarthy, 1994). Some minority students are reluctant to enter the field of agriculture due to the traditional image it portrays. The image of agriculture can be "perceived" or "real" to minority students (Larke, 1987; White, 1988). Hunte (1992) reminds us how slavery and later, sharecropping, provided an entirely different agricultural orientation for minorities,
especially African Americans. Hispanic students can also relate to the unfavorable image of agriculture, due to the stereotypes of migrant farming and sharecropping (Reed & Flores, 1987). Minorities' negative perceptions of agriculture are still prevalent today through various stereotypes related to farming, limited socioeconomic status, and low wages (Bowen, 1987; Hunte, 1992; Larke & Barr, 1987).

Some relate this challenge to the lack of awareness among minorities about the enormous range of employment opportunities (Trotter, 1988). Gardner (1991) suggests that students should be aware of the vast employment and career advancements, the competitive salaries and the ability to utilize agriculture careers in business, science, and engineering professions. To make agriscience careers more visible, Lewis (1994) recommended that apprenticeship opportunities for minority students be expanded. This expansion involved cooperation with government, university and industry in outreach and hands-on research experiences.

A study conducted on how high school students viewed agriculture, done by the UC-Davis College of Agriculture and Environmental Sciences, revealed that high school students were unaware of the various career opportunities. Therefore, in order to recruit academically prepared individuals into agriculture, introduction to the various career opportunities must be presented as early as elementary school.

**Internships and Pre-College Programs**

According to Fog (1980), a need exists to combine "true to life" laboratory and classroom experiences with conditions that students will encounter on the job. Internships serve as the bridge between classroom teaching and actual work experience. According to
Agnew and Cole (2001), youth apprenticeships in agriculture can help meet the needs of today's agricultural industry.

In 1987, Southern University's Beginning Agricultural Youth Opportunity Unlimited (BAYOU) Phase I Program began. The focus of this program was to attract academically talented high school youth into food and agricultural science-related careers (Rawls, Martin, Negatu, & Robertson, 1994).

Other pre-college programs include the Minority Apprenticeship Program (MAP) at Michigan State University and the Agricultural Institute for Minority Students (AIMS) at Pennsylvania State University. MAP began in 1983 with a 7-week program to educate minority high school students of careers in agriculture and natural sciences.

To be successful, Fog (1980) recommends that a cooperative internship education program must have an administration that supports the program academically and financially, a supportive faculty that will provide leadership for students and employers willing to provide real educational experiences for students. The faculty-student mentoring alliance is a key element to a successful internship program (Woirhaye & Menkhaus, 1996).

Although internships are offered, few students take advantage of such an opportunity (Zimmerman, 1996). Zimmerman made the following recommendations for developing an internship course: (1) make internships a required course, (2) require interns to be paid, (3) student should be responsible for finding internship employment, (4) design and implement a well-structured and organized program, (5) provide a clearly-written and comprehensive course syllabus, (6) minimize paperwork and formal obligations for employers, (7) develop and provide standardized forms for students and employers, (8) hold pre-internship sessions with students, (9) carefully evaluate each proposed internship position and employee prior to
approving it as an internship station, (10) do not get directly involved in wage or salary negotiations, (11) offer the internship experience as a graded course, (12) use several different criteria and assignments as a basis for internship grades, (13) assign a term paper as a major requirement of the internship, (14) require students to keep a journal during their internship experience, (15) use the employer’s and instructor’s evaluation to assign a grade for the internship, (16) make at least one on-site visit, (17) require that students enroll in and pay fees for the internship course during the quarter or semester in which they intern, and (18) include the internship course in calculations of teaching load. These recommendations can be very helpful in developing an internship course. The ISU Agriculture Minority Summer Internship Program already utilizes some of Zimmerman’s suggestions. The program provides interns with stipends, tries to minimize paperwork by providing an orientation for interns and mentors, requires students to keep a journal of their summer experience and the staff makes at least one site visit during the internship program. Some of the listed recommendations are not optional for the AMSRIP due to the length of the program.

Patreese Ingram (2001) stated, “incorporating mini-diversity experiences into the curricula is one way to help prepare our current students for successful employment in a workplace that is becoming increasingly diverse” (p. 21).
CHAPTER III. METHODOLOGY

The purpose of this study was to evaluate the effects of the ISU Agriculture Minority Summer Research Internship Program. Specific objectives of this study were the following:

1. To determine the factors that encouraged participants to apply for the program.
2. To determine if the students’ expectations were met.
3. To identify key factors that influenced students not to major in agriculture.
4. To determine if program characteristics and demographic variables influenced the learning experience.
5. To identify students’ perceptions regarding the usefulness of the research internship program in contributing to their future career and college major selection, and
6. To identify factors that enhanced or inhibited minority student recruitment and retention at Iowa State University specifically within the College of Agriculture.

This chapter contains, in detail, the methods utilized to describe the population/sample, the research design, the pilot test, methods of data collection, and analysis. Assumptions and limitations to the study will also be discussed.

Population

Although the ISU Agriculture Minority Summer Research Internship program began in 1994, most students between the 1994-1997 years could not be contacted due to incomplete files, outdated addresses, and telephone numbers, tracking of former interns was
difficult. As of 2001, the target population was the 94 students who had participated in the internship program. Therefore, the accessible population of the study consisted of 60 former Agriculture Minority Summer Research Interns who completed a minimum of one summer at Iowa State University between the 1998-2001 years. The internship program was established to introduce minority high school and college students to conduct research during the 6 week long program for high school and/or 8 week long program for undergraduate students. As part of its diversity recruitment/retention strategy, it was assured that this program could help increase minority enrollment in the field of agriculture, in the College of Agriculture at Iowa State University as well as the University as a whole (Agriculture Diversity Programs, 2001).

The researcher made attempts to locate former participants utilizing emergency contact information and the World Wide Web, but was unsuccessful due to the geographic locations required for tracking. Therefore, the accessible sampling frame for this study was limited to the 60 interns who participated in the Agriculture Minority Summer Research Internship Program during the 1998-2001 summer sessions. During this time period, the researcher coordinated the Agriculture Minority Summer Research Internship Program and still had some contacts through email and by telephone with former participants. However, no formal database containing former interns was available. The researcher then made further contact with former interns by email and telephone to locate each intern's new/updated address, telephone number, and email accounts based on previous contact information within each student's file folder during the months of August and September 2001.

According to Ary, Jacobs, and Razavieh (1996), a census study includes the entire population of interest. A census study of the accessible population was conducted using all
60 former interns from 1998 to 2001. The list of previous interns was obtained from the Office of Minority Programs, College of Agriculture, Iowa State University. The list contained information about the previous mailing addresses and telephone numbers of the interns. An on-line inquiry for information was completed by utilizing email accounts to solicit updated addresses and telephone numbers. Refer to Appendix B. The participants in this study represented a specialized population (former agriculture minority interns) and no sampling techniques were used. Therefore, the results of this study have limited generalizability to other summer minority internship programs. That is, the results can only be generalized to minority populations and/or institutions that share the significant characteristics with those who participated in the study. The results of this research are applicable directly only to the Agriculture Minority Summer Research Internship Program at Iowa State University. However, the intent of the study was to describe general trends and provide data for programmatic decisions related to Agriculture Minority Programs, College of Agriculture, and Iowa State University. The information may be useful to other programs or other universities considering the development of internship programs. This study also identified variables for investigation in future studies.

**Survey Design**

This study was conducted utilizing descriptive statistics, a method for presenting quantitative description and distributions of variables (Agresti & Finlay, 1997; Babbie, 1990; George & Mallery, 2001). Fink and Kosecoff (1998) elaborated, stating that descriptive statistics includes counts (numbers or frequencies), proportions (percentages), measures of
central tendency (the mean, median, and mode), and measures of variation (range, standard deviations). These all include ways in which the researcher displayed the data.

The researcher chose to collect data from former interns by utilizing self-administered surveys due to the geographic locations of participants and cost effectiveness rather than personal or telephone interviews. This survey instrument was developed for a small sample size and a core group on individuals, which provided information for the researcher and Agriculture Minority Programs. Surveys are a system for collecting information by asking the respondents questions and one of the most frequently used methods of collecting data in research studies (Ary, Jacobs, & Razavieh, 1996; Bourgue & Fielder, 1995). This researcher formulated objectives and reviewed the relevant literature to develop the survey. Consistent with the study's objectives: 1) to determine the factors that encouraged participants to apply for the program, 2) to determine if the students' expectations were met, 3) to identify key factors that influenced students not to major in agriculture, 4) to determine if program characteristics and demographic variables influenced the learning experience, 5) to identify students' perceptions regarding the usefulness of the research internship program in contributing to their future careers and college major selections, and 6) to identify factors that enhanced and inhibited minority student recruitment and retention at Iowa State University specifically within the College of Agriculture. The survey consisted of seven sections plus demographic information and ten open-ended questions, providing qualitative information. Below is a description of each section.

Section 1, Applying to the Program, focused on students' interests in applying to the program. In addition, respondents were asked which schools (high school or college) they attended during their internship experience. This question informs the program on what
attracts students to apply and what other incentives that may or may not need to be included for recruiting purposes. Students were also asked which institution they attended prior to enrolling in the internship program. The researcher was able to compare the number of institutions who have had the highest participation thus far. This also informs the program which institutions to send future mailings for continuous recruiting efforts. Other institution representatives were also contacted at professional conferences, such as the National MANRRS Conference and the National Hispanic Conference.

In Section 2, Student Expectations, a Likert-type scale to assess student expectations was used. Likert scales assess attitudes toward a topic by presenting a set of statements about the topic and asking respondents to indicate their responses (Ary, Jacobs, & Razavieh, 1996). An assessment of student's opinions regarding internship expectations, social expectations, career expectations, and overall expectations for the program used a Likert-type scale which had the following response options: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree. Using open-ended responses, students also indicated what they learned, enjoyed and disliked about the Agriculture Minority Summer Research Internship program.

In Section 3, Majoring in Agriculture-Related Subject Areas: five statements represented agriculture-related subject areas. This section provided information on whether or not a student was still attending college and if so, what was the major. Students were also asked to indicate attributes that encouraged or discouraged them from majoring in agriculture-related areas.

Section 4, The Learning Experience, students ranked their internship experiences according to their opinions in order of importance to them. This section also provided
feedback on the skills learned, knowledge gained, and the overall learning experience relating to their mentor and the subject area studied.

Section 5. Agriculture Involvement, addressed whether students are currently involved in agriculture-related areas, since completion of the program and if so, to what capacity and if they are currently employed or plan to seek future employment in an agriculture-related area.

Section 6. Recruitment/Retention, targeted recruitment/retention efforts of interns as potential undergraduate or graduate students at Iowa State University and their reasons for attending or not attending. Participants used open-ended questions to list specific barriers or possibilities used in making their decisions.

Section 7. General Information, provided general demographic information on all interns, such as, gender, age, ethnicity, and education. These data provide information to compare based on who is attending, age, race, and educational level completed.

The Iowa State University Institutional Review Board approved the survey materials Fall 2001 (Appendix A). A copy of the instrument used is provided in Appendix B.

Pilot Test

After formulating survey questions based on the research objectives and a review the literature, a sample survey was constructed. To assess the validity, the degree to which a survey instrument assesses what it purports to measure, a panel was selected (Fink, 1995; Ary, Jacobs, & Razavieh, 1996). A panel of five faculty members/staff established content and face validity for the survey. Face validity infers that the survey instrument appears valid
for its intended purposes, while content validity assesses whether the instrument items are appropriate (Ary, Jacobs, & Razavieh, 1996).

After assessing the validity of the instrument, the survey was then piloted tested. The pilot test serves as a review of the instrument prior to administration to the target population (Babbie, 1990). The pilot test was administered to all five undergraduate students in the Agriculture Minorities Empowered for Success Learning Community (AMES). These minority students were selected because they were similar in make-up to the target population and were interested in agriculture-related majors (Babbie, 1990; Fink, 1995). This small group setting allowed the researcher to obtain quantitative as well as qualitative information feedback on the construction of the survey. As a result of the pilot test, minor changes in wording were made to the survey to clarify understanding of the instructions.

As a result, changes were made in the survey instrument to increase the reliability, the extent to which a measure yields consistent results (Ary, Jacobs, & Razavieh, 1996). A Cronbach alpha test sometimes known as the coefficient alpha test was used to measure items relating to attitude/opinion tests (Ary, Jacobs, & Razavieh, 1996). Making decisions about groups requires a reliability coefficient in the range of .50 to .60 (Ary, Jacobs, & Razavieh, 1996). The reliability alphas from the pilot test study appear in Table 1.

<table>
<thead>
<tr>
<th>Sections</th>
<th>Number of items</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student expectations</td>
<td>26</td>
<td>0.8277</td>
</tr>
<tr>
<td>overall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internship expectations</td>
<td>10</td>
<td>0.8056</td>
</tr>
<tr>
<td>Social expectations</td>
<td>8</td>
<td>0.6311</td>
</tr>
<tr>
<td>Career expectations</td>
<td>8</td>
<td>0.6127</td>
</tr>
<tr>
<td>Cronbach's alpha</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data Collection

After obtaining current addresses for the target population, a letter explaining in detail the study and survey was mailed on October 1, 2001, to each selected former intern. Refer to Appendix B. The first contact was sent to all members of the population (Dillman, 1978; Salant & Dillman, 1994). One week later, October 5, 2001, the survey packet for completion by the interns was mailed according to Salant and Dillman’s (1994) and Ary, Jacobs, Razavieh, (1996) procedures. They both suggest that 1) all members of the sample receive a personalized letter, 2) about a week later a personalized cover letter is sent with the survey, 3) a week to 10 days after the initial mailing, send a follow-up postcard, and 4) a final reminder letter and an additional survey are sent. Therefore, the survey packet sent consisted of a cover letter, the survey, mailing procedures, and $1 as an incentive to return the survey in a timely manner. Research has shown that a monetary incentive increases the response rate of participants (Ary, Jacobs. & Razavieh, 1996; Bourque & Fielder, 1995). Also enclosed was a consent form sent to the parents of four interns, who were considered minors between the ages of 14-17. Refer to Appendix B. Thirty-four interns (57%) responded, based on the initial survey.

Former participants in California and Hawaii reported never receiving the initial mailing but did receive the follow-up mailing. During the time the researcher issued the initial survey, the United States of America had suffered tragic losses on the September 11, 2001 being the target of terrorist attacks. Shortly after this occurrence, the United States again was struck with Anthrax, contaminating the United States Postal Service. According to the Congressional Quarterly (2001), terrorist attacks and the specter of anthrax in the mails
have dealt the Postal Service a severe blow... Mail was reported to be moving at a slower pace than normal and even closed some post offices.

Another packet, including a follow-up letter and survey was sent on October 23, 2001 to non-respondents (Salant & Dillman, 1994; Ary, Jacobs, and Razavieh, 1996). Follow-up emails and telephone calls made by the researcher were used to encourage the interns to return the survey. As a result of reminder contacts made, an additional 26 respondents (43%) returned completed surveys, resulting in a total of 51 interns (85%) having completed and returned the survey and 9 non-respondents. According to Ary, Jacobs, and Razavieh (1996), responses between 75 and 90% are sufficient to terminate follow-ups. Therefore the data collection was completed and ready for analysis during the next stage.

Data Analysis

The data collected from the participants were coded, entered, and analyzed by the researcher. Data were entered into an Excel spreadsheet program, and were analyzed using the Statistical Product and Service Solutions formally known as the Statistical Package for the Social Sciences, Personal Computer Version (SPSS/PC), 8.0 (George & Mallery, 2001). Since social science is the focus of this research, SPSS software was utilized to apply statistical methods to analyze the data and answer the research questions of this study (Agresti & Finlay, 1997). Descriptive statistics were computed and included frequencies (numbers), proportions (percentages), measures of central tendency (the mean, median, and mode), and measures of variation (range, standard deviation)(Fink & Kosecoff, 1998).

Open-ended questions were examined for common themes. Qualitative research is multimethod in focus, involving interpretive, naturalistic approach to its subject matter.
According to Stake (1995), qualitative research provides a holistic understanding of the subject. Participants shared in depth view of the internship program based on their opinions and perceptions. The researcher will attempt to combine personal experiences, observations, and historical notes as interconnected methods, utilizing common themes that appear in the data.

Assumptions of the Study

The study has the following assumptions:

- The interns' answers reflect their honest opinion and rely on their memory in regard to the Agriculture Minority Summer Research Internship Program.
- Survey methods were a valuable means to collect such data.
- The program was similar each year, therefore no significant changes to report about the program activities from 1998-2001.

Limitations of the Study

This study has the following limitations:

- The results of this study are limited to the opinions and reflections of 1998-2001 Agriculture Minority Summer Research Interns.
- The results of this research are applicable most directly to the Agriculture Minority Summer Research Internship Program in the College of Agriculture at Iowa State University or similar programs at similar universities.
- The survey used to collect data from the population was designed specifically for this study. Changes to this survey may be necessary prior to its use in similar future studies.
• The researcher was unable to track some former interns due to outdated addresses and telephone numbers. Because more than 30% of former interns were not surveyed due to outdated contact information, the sample was restricted to approximately 68% of the Agriculture Minority Summer Research Internship Program participants.
CHAPTER IV. RESULTS AND DISCUSSION

The purpose of this study was to evaluate the impact of the experiences high school and undergraduate students received while attending Iowa State University's Agriculture Minority Summer Research Internship Program. The specific objectives of the study included:

1. To determine the factors that encouraged participants to apply for the program.
2. To determine if students' expectations were met.
3. To identify key factors that influenced students not to major in agriculture.
4. To determine if program characteristics and demographic variables influence the learning experience.
5. To identify students' perceptions regarding the usefulness of the research internship program in contributing to their future career and college major selection.
6. To identify factors that enhanced and inhibited minority student recruitment and retention at Iowa State University within the College of Agriculture.

To fulfill the purpose of this study, the following research questions are addressed:

1. What factors encouraged participants to apply to the internship program?
2. Were student expectations met?
3. What key factors influence students from majoring in agriculture?
4. What program characteristics and demographic variables influence the learning experience?
5. What were students' perceptions regarding the usefulness of the internship program in relation to their future careers and major selection?

6. What factors enhanced or inhibited recruitment and retention of minority students at Iowa State University within the College of Agriculture?

A descriptive survey method was used in this study to collect data from 1998-2001 former Agriculture Minority Summer Research Interns. Data was collected using a self-developed survey instrument mailed to 60 interns of the accessible population. A total of 51 (85%) of the accessible population contributed available data for this study.

<table>
<thead>
<tr>
<th>Surveys Mailed</th>
<th>Responses Received</th>
<th>Return Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>51</td>
<td>85%</td>
</tr>
</tbody>
</table>

This chapter is divided into the following sections: (a) Demographic characteristics of respondents. (b) Applying to the program (c) Student expectations. (d) Majoring in agriculture-related subject areas. (e) The Learning experience. (f) Agriculture involvement. (g) Recruitment and retention.

**Characteristics of Respondents**

This section describes in detail the demographic characteristics of the respondents. Respondents answered questions of general information, relating to gender, age, ethnicity, and education completed.
Table 3. Demographic characteristics of respondents

<table>
<thead>
<tr>
<th>Item</th>
<th>Descriptions</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>19</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>32</td>
<td>62.7</td>
</tr>
<tr>
<td>Age</td>
<td>16-20</td>
<td>26</td>
<td>51.0</td>
</tr>
<tr>
<td></td>
<td>21-25</td>
<td>20</td>
<td>39.2</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>31-34</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Black/African American</td>
<td>25</td>
<td>49.0</td>
</tr>
<tr>
<td></td>
<td>Latino/Hispanic</td>
<td>9</td>
<td>17.6</td>
</tr>
<tr>
<td></td>
<td>Asian American/Pacific Islander</td>
<td>11</td>
<td>21.6</td>
</tr>
<tr>
<td></td>
<td>Native American/American Indian</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>Highest Level of</td>
<td>High School</td>
<td>34</td>
<td>66.7</td>
</tr>
<tr>
<td>Education Completed</td>
<td>Associate’s Degree</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s Degree</td>
<td>14</td>
<td>27.5</td>
</tr>
</tbody>
</table>

According to the demographic characteristics reported, females accounted for (62.7%) compared to the (37.7%) males who completed the internship program. This may explain why female students have attended post secondary education at a more rapid rate than male students have since the 1980’s. Recent statistics have projected that during the 1999-2000 year, a total of 668,000 females will graduate with Bachelor Degrees compared to the 517,000 males from American colleges and universities (National Center for Education Statistics, 2001). Since 1998, the AMSRIP has been able to recruit and retain more males than females.

Respondents’ ages ranged from 16-34 years of age. Twenty-six (51%) indicated an age of 20 years or less; 20 (39.2%) respondents indicated an age between 21-25; 4 (7.8%) respondents indicated an age between 26-30; and 1 (2%) respondent indicated an age of 34
years. The range of ages could be attributed to the fact that high school as well as undergraduate students are allowed to participate in the internship program.

The ethnicity of respondents were majority. 25 (49%) Black/African Americans. The second highest number of respondents was 11 (21.6%) Asian Americans. Nine (17.6%) Latino/Hispanic interns responded and 6 (11.8%) of the intern respondents were Native American/American Indians. The high number of African Americans that have attended the program could be attributed to the 1890 partnership collaboration projects that exist between those institutions and Iowa State University.

The highest level of education was 34 (66.7%) high school graduates. Fourteen (27.5%) interns had completed a bachelors degree while 3 (5.9%) had completed associate degrees. Fourteen (27.5%) interns had completed a bachelors degree while 3 (5.9%) had completed associate degrees. After high school, the United States Department of Labor (2001), stated, that of the 2.8 million high school graduates, 1.7 million (63.3%) were enrolled in college the following October 2000. A majority of the interns also reported that they are enrolled in some type of post secondary education.

**Objective 1. To determine the factors that encouraged participants to apply for the program.**

Former interns were asked how they learned of the Agriculture Minority Summer Research Internship Program at Iowa State University. Twenty-one (41.2%) indicated they found out about the program by utilizing the World Wide Web, email and friends. Others indicated that they heard of the program from (25.5%) schoolteachers and (15.7%) from guidance counselors. Refer to Table 4. These results indicate that today's youth are
utilizing the World Wide Web to locate vital academic programs, scholarships, and other educational opportunities available. Therefore it is important that the AMSRIP continue to keep information and applications accessible for students on their website address:

http://www.ag.iastate.edu/student/minority.html so they can download the application and prepare their packets. The program keeps an updated list of high school and undergraduate institutions to send notification via the postal service to schoolteachers, guidance counselors, and faculty, who can distribute and select potential students for the internship program.

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other-World Wide Web, Email, and Friends</td>
<td>21</td>
<td>41.2</td>
</tr>
<tr>
<td>School Teacher</td>
<td>13</td>
<td>25.5</td>
</tr>
<tr>
<td>Guidance Counselor</td>
<td>8</td>
<td>15.7</td>
</tr>
<tr>
<td>Family Members</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Former Participants</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td>Don't Remember</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Community</td>
<td>b</td>
<td></td>
</tr>
</tbody>
</table>

Of the 51 participants, 48 (94.1%) of the interns indicated that they applied to the internship to gain research/educational experience. Thirty participants (58.8%) choose to apply to receive a stipend/paycheck and 27 (52.9%) a trip away from home. Additional items found in Table 5. Participants were allowed to circle more than one item, therefore, responses do indicate a cumulative 100%. Responses reflected student interest in learning how to conduct research.

Students are given the opportunity to apply for the AMSRIP more than once. Majority of the participants 46 (90.2%) have only attended the internship program once.
However, three (5.9%) attended the internship program at least two times and 1 (2.0%) completed the internship program three times. One person chose not to indicate how many times they had participated in the program. While attending the program, 31 (60.8%) of the students were undergraduate college students, while 20 (39.2%) were attending high school when they participated in the program.

Table 5. Interest in applying

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research/educational experience</td>
<td>48</td>
<td>94.1</td>
</tr>
<tr>
<td>Stipend/Paycheck</td>
<td>30</td>
<td>58.8</td>
</tr>
<tr>
<td>Trip away from home</td>
<td>27</td>
<td>52.9</td>
</tr>
<tr>
<td>Interest in environmental/natural resources</td>
<td>16</td>
<td>31.4</td>
</tr>
<tr>
<td>Interest in food/human nutrition</td>
<td>8</td>
<td>15.7</td>
</tr>
<tr>
<td>Interest in animals</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Interest in horticulture</td>
<td>4</td>
<td>1.6</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>9.8</td>
</tr>
</tbody>
</table>

To participate in the internship program, students must be at least 16 years of age. The research study revealed that most of the students applied as either an undergraduate junior 13 (25.5%) or a high school junior 9 (17.6%). Sixteen was the recommended age for high school students to work within the State of Iowa conducting laboratory work. This decision was also made due to the lack of maturity high school students under 16 that the program has had in the past.

Students who have attended the AMSRIP have not only been diverse in nationality, but also geographically diverse. Participants have attended over 23 different colleges/universities and 15 high schools nationwide (see Appendix). In the past, besides
agriculture, students have majored in business, sociology, political science and sports science to name a few. It is not necessary for participants to have prior knowledge about agriculture but they must have an interest or desire to learn about agriculture-related subject areas. The survey asked students to report on how much understanding of agriculture they had prior to attending the program (see Table 6). Eighteen (35.3%) students reported having a little knowledge while 17 (33.3%) students reported having some knowledge of agriculture prior to attending the AMSRIP.

Table 6. Respondents knowledge of agriculture prior to attending AMSRIP

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a little</td>
<td>18</td>
<td>35.3</td>
</tr>
<tr>
<td>Some</td>
<td>17</td>
<td>33.3</td>
</tr>
<tr>
<td>a lot</td>
<td>11</td>
<td>21.6</td>
</tr>
<tr>
<td>None</td>
<td>5</td>
<td>9.8</td>
</tr>
</tbody>
</table>

So, where have these participants obtained this agriculture-related information? Over 58.8% noted receiving agriculture-related information from studying agriculture in either high school or college. Only 4 to 5% of the interns received agricultural information from agricultural youth organizations such as 4-H and FFA. A need exists to educate more minority youth about agriculture early on. This would allow minorities to know the opportunities that are available to them in agriculture.
Table 7. Respondents obtained understanding of agriculture

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studying in school (college or high school)</td>
<td>30</td>
<td>58.8</td>
</tr>
<tr>
<td>Personal/employment experience</td>
<td>17</td>
<td>33.3</td>
</tr>
<tr>
<td>Family members</td>
<td>14</td>
<td>27.4</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td>FFA</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>4-H</td>
<td>4</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Now that we know how much agriculture information students had prior to attending and exactly how they obtained that information, it is important to find out if the internship programs broaden their understanding of agriculture-related subject matters. Twenty-five (49%) students indicated that their understanding of agriculture had broadened a lot as a result of attending the AMSRIP. Seventeen (33.3%) students noted their knowledge expanded some as a result of attending the AMSRIP.

...I definitely have a better understanding of Agriculture and the careers and majors attributed to the subject...Native American female, 19

Table 8. Respondents broadened their understanding of agriculture following AMSRIP

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a lot</td>
<td>25</td>
<td>49.0</td>
</tr>
<tr>
<td>Some</td>
<td>17</td>
<td>33.3</td>
</tr>
<tr>
<td>a little</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td>None</td>
<td>2</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Objective 2. To determine if the students' expectations were met.

To meet this objective, student expectations were divided among four sections: 1) internship expectations, 2) social expectations, 3) career expectations, and 4) overall
expectations. Students were asked to select one of the four options given using a Likert-type scale. The scale equivalencies were 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The researcher chose not to include a neutral or mid-point item, to encourage participants to select one decision regarding each question.

The internship expectations section included ten statements regarding the respondents' perceptions of what the intern expected while attending the internship program. The attitudes of the interns towards their overall perceptions of internship expectations met were generally positive.

Frequencies, means, and standard deviations were calculated on each of the ten statements regarding internship expectations (see Table 9). Students expected to complete a research project (M = 3.61; SD = .49) while attending the program. Respondents also agreed that it was important to participate in every aspect of the research project (M = 3.43; SD = .61) and to have regular one-on-one time with a faculty mentor (M = 3.37; SD = .72). The statements that received the lowest means (M=1.94; SD = .88 and M=1.82; SD=.89) were to spend my work time taking classes. Students disagreed this was the least of what they expected to be doing while attending the internship program.
Table 9. Respondents’ perceptions of internship expectations

<table>
<thead>
<tr>
<th>When I attended the AMSRIP, I expected to:</th>
<th>SD f(%)</th>
<th>D f(%)</th>
<th>A f(%)</th>
<th>SA f(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Spend my work time at a farm</td>
<td>23 (45.1)</td>
<td>16 (31.4)</td>
<td>10 (19.6)</td>
<td>2 (3.9)</td>
</tr>
<tr>
<td>2. Spend my work time in a research laboratory</td>
<td>5 (9.8)</td>
<td>3 (5.9)</td>
<td>24 (47.1)</td>
<td>19 (37.3)</td>
</tr>
<tr>
<td>3. Spend my work time taking classes</td>
<td>18 (35.3)</td>
<td>21 (41.2)</td>
<td>9 (17.6)</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>4. Have regular one-on-one time with a faculty mentor</td>
<td>1 (2.0)</td>
<td>4 (7.8)</td>
<td>21 (41.2)</td>
<td>25 (49.0)</td>
</tr>
<tr>
<td>5. Spend my work time conducting library research</td>
<td>4 (7.8)</td>
<td>12 (23.5)</td>
<td>23 (45.1)</td>
<td>12 (23.5)</td>
</tr>
<tr>
<td>6. Conduct research classes</td>
<td>7 (13.7)</td>
<td>9 (17.6)</td>
<td>25 (49.0)</td>
<td>10 (19.6)</td>
</tr>
<tr>
<td>7. Complete a research project</td>
<td>b</td>
<td>b</td>
<td>20 (39.2)</td>
<td>31 (60.8)</td>
</tr>
<tr>
<td>8. Participate in every aspect of a research project</td>
<td>b</td>
<td>3 (5.9)</td>
<td>23 (45.1)</td>
<td>25 (49.0)</td>
</tr>
<tr>
<td>9. Find significant results in my research project</td>
<td>b</td>
<td>8 (15.7)</td>
<td>26 (51.0)</td>
<td>17 (33.3)</td>
</tr>
<tr>
<td>10. Work in a research group</td>
<td>3 (5.9)</td>
<td>7 (13.7)</td>
<td>25 (49.0)</td>
<td>16 (31.4)</td>
</tr>
</tbody>
</table>

Note: Scale SD=Strongly disagree, D=Disagree, A=Agree, and SA=Strongly Agree

* N=51

Table 10 represents the means and standard deviations of respondents’ perceptions of internship expectations.

Table 10. Means and standard deviations of respondents’ perceptions of internship expectations

<table>
<thead>
<tr>
<th>When I attended the AMSRIP, I expected to:</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Spend my work time at a farm</td>
<td>1.82</td>
<td>0.89</td>
</tr>
<tr>
<td>2. Spend my work time in a research laboratory</td>
<td>3.12</td>
<td>0.91</td>
</tr>
<tr>
<td>3. Spend my work time taking classes</td>
<td>1.94</td>
<td>0.88</td>
</tr>
<tr>
<td>4. Have regular one-on-one time with a faculty mentor</td>
<td>3.37</td>
<td>0.72</td>
</tr>
<tr>
<td>5. Spend my work time conducting library research</td>
<td>2.84</td>
<td>0.88</td>
</tr>
<tr>
<td>6. Conduct research classes</td>
<td>2.74</td>
<td>0.93</td>
</tr>
<tr>
<td>7. Complete a research project</td>
<td>3.61</td>
<td>0.49</td>
</tr>
<tr>
<td>8. Participate in every aspect of a research project</td>
<td>3.43</td>
<td>0.61</td>
</tr>
<tr>
<td>9. Find significant results in my research project</td>
<td>3.18</td>
<td>0.68</td>
</tr>
<tr>
<td>10. Work in a research group</td>
<td>3.06</td>
<td>0.83</td>
</tr>
</tbody>
</table>

* N=51

Table 11 displays the data on the respondents’ perceptions of social expectations in regards to the internship program based on eight statements. All 51 (100%) respondents strongly agreed or agreed that they expected to meet new friends (M = 3.69; SD = .47) during the internship program (see Table 12). The next highest mean was distributed over 3
different statements: to learn more about Ames, Iowa, and Iowa State University (M = 3.20; SD = .75),
to explore career options during my free time (M = 3.20; SD = 1.11), and to have
interesting and fun planned social activities (M = 3.20; SD = .75) were items of interest to the
participants.

Table 11. Respondents' perceptions of social expectations*

<table>
<thead>
<tr>
<th>When I attended the AMSRIP, I expected:</th>
<th>SD f(%)</th>
<th>D f(%)</th>
<th>A f(%)</th>
<th>SA f(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To spend my free time playing sports</td>
<td>11 (21.6)</td>
<td>20 (39.2)</td>
<td>16 (31.4)</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>2. To spend my free time hanging out with friends</td>
<td>3 (5.9)</td>
<td>6 (11.8)</td>
<td>28 (54.9)</td>
<td>14 (27.5)</td>
</tr>
<tr>
<td>3. To meet new friends</td>
<td>b</td>
<td>b</td>
<td>16 (31.4)</td>
<td>35 (68.6)</td>
</tr>
<tr>
<td>4. To explore career options during my free time*</td>
<td>2 (3.9)</td>
<td>6 (11.8)</td>
<td>28 (54.9)</td>
<td>14 (27.5)</td>
</tr>
<tr>
<td>5. To learn more about Ames, Iowa, and Iowa State University</td>
<td>2 (3.9)</td>
<td>4 (7.8)</td>
<td>27 (52.9)</td>
<td>18 (35.3)</td>
</tr>
<tr>
<td>6. The program to have interesting and fun planned social activities</td>
<td>2 (3.9)</td>
<td>4 (7.8)</td>
<td>27 (52.9)</td>
<td>18 (35.3)</td>
</tr>
<tr>
<td>7. To have many social interactions with Iowans</td>
<td>4 (7.8)</td>
<td>18 (35.3)</td>
<td>24 (47.1)</td>
<td>5 (9.8)</td>
</tr>
<tr>
<td>8. A range of culturally diverse activities and services</td>
<td>2 (3.9)</td>
<td>7 (13.7)</td>
<td>29 (56.9)</td>
<td>13 (25.5)</td>
</tr>
<tr>
<td>(e.g. churches, hair salons, movies, celebrations, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Scale SD=Strongly disagree. D=Disagree. A=Agree. and SA=Strongly Agree
*a For question 4, one respondent did not give an answer, so the frequency is based upon N=50.
*b No response

...I loved making new friends...Asian American male, 19

...I not only grew in knowledge. I also made great lifelong friends. I still
keep in contact with many people from the program and definitely look back
on my summer with good memories...Native American female, 19

Table 12. Means and standard deviations for respondents' perceptions of social expectations*

<table>
<thead>
<tr>
<th>When I attended the AMSRIP, I expected:</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To spend my free time playing sports</td>
<td>2.25</td>
<td>0.89</td>
</tr>
<tr>
<td>2. To spend my free time hanging out with friends</td>
<td>3.04</td>
<td>0.80</td>
</tr>
<tr>
<td>3. To meet new friends</td>
<td>3.69</td>
<td>0.47</td>
</tr>
<tr>
<td>4. To explore career options during my free time</td>
<td>3.20</td>
<td>1.11</td>
</tr>
<tr>
<td>5. To learn more about Ames, Iowa, and Iowa State University</td>
<td>3.20</td>
<td>0.75</td>
</tr>
<tr>
<td>6. The program to have interesting and fun planned social activities</td>
<td>3.20</td>
<td>0.75</td>
</tr>
<tr>
<td>7. To have many social interactions with Iowans</td>
<td>2.60</td>
<td>0.78</td>
</tr>
<tr>
<td>8. A range of culturally diverse activities and services</td>
<td>3.04</td>
<td>0.75</td>
</tr>
<tr>
<td>(e.g. churches, hair salons, movies, celebrations, etc.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a N=51
In the career expectation section, eight statements were provided for participants to make a selection (see Table 13). Participants were expecting to meet minorities working in or pursuing agriculture careers ($M = 3.41; SD = .70$). They also expected to interact with agriculture professionals ($M = 3.33; SD = .68$) and to learn about agriculture education opportunities ($M = 3.27; SD = .75$).

Table 13. Respondents' perceptions of career expectations

<table>
<thead>
<tr>
<th>When I attended the AMSRIP, I expected:</th>
<th>SD f(%)</th>
<th>D f(%)</th>
<th>A f(%)</th>
<th>SA f(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To learn about various agriculture majors</td>
<td>b</td>
<td>11 (21.6)</td>
<td>24 (47.1)</td>
<td>16 (31.4)</td>
</tr>
<tr>
<td>2. To learn about various agriculture careers</td>
<td>b</td>
<td>7 (13.7)</td>
<td>26 (51.0)</td>
<td>18 (35.3)</td>
</tr>
<tr>
<td>3. To visit or tour various agriculture businesses</td>
<td>1 (2.0)</td>
<td>10 (19.6)</td>
<td>29 (56.9)</td>
<td>11 (21.6)</td>
</tr>
<tr>
<td>4. To learn about my specific agriculture interests</td>
<td>b</td>
<td>5 (9.8)</td>
<td>29 (56.9)</td>
<td>17 (33.3)</td>
</tr>
<tr>
<td>5. To interact with agriculture professionals</td>
<td>b</td>
<td>6 (11.8)</td>
<td>22 (43.1)</td>
<td>23 (45.1)</td>
</tr>
<tr>
<td>6. To meet minorities working in or pursuing agriculture careers</td>
<td>1 (2.0)</td>
<td>3 (5.9)</td>
<td>21 (41.2)</td>
<td>26 (51.0)</td>
</tr>
<tr>
<td>7. To learn about agriculture employment opportunities</td>
<td>1 (2.0)</td>
<td>6 (11.8)</td>
<td>25 (49.0)</td>
<td>19 (37.3)</td>
</tr>
<tr>
<td>8. To learn about agriculture education opportunities</td>
<td>1 (2.0)</td>
<td>6 (11.8)</td>
<td>22 (43.1)</td>
<td>22 (43.1)</td>
</tr>
</tbody>
</table>

Note: Scale SD=Strongly disagree, D=Disagree, A=Agree, and SA=Strongly Agree

Table 14 represents the means and standard deviations for respondents' perceptions of career expectations.

Table 14. Means and standard deviations for respondents' perceptions of career expectations

<table>
<thead>
<tr>
<th>When I attended the AMSRIP, I expected:</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To learn about various agriculture majors</td>
<td>3.10</td>
<td>0.73</td>
</tr>
<tr>
<td>2. To learn about various agriculture careers</td>
<td>3.22</td>
<td>0.67</td>
</tr>
<tr>
<td>3. To visit or tour various agriculture businesses</td>
<td>3.00</td>
<td>0.71</td>
</tr>
<tr>
<td>4. To learn about my specific agriculture interests</td>
<td>3.23</td>
<td>0.62</td>
</tr>
<tr>
<td>5. To interact with agriculture professionals</td>
<td>3.33</td>
<td>0.68</td>
</tr>
<tr>
<td>6. To meet minorities working in or pursuing agriculture careers</td>
<td>3.41</td>
<td>0.70</td>
</tr>
<tr>
<td>7. To learn about agriculture employment opportunities</td>
<td>3.22</td>
<td>0.73</td>
</tr>
<tr>
<td>8. To learn about agriculture education opportunities</td>
<td>3.27</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Notes:

* N=51

# No response
The overall student expectations were also calculated (see Table 15). Participants' believed the AMSRIP met their expectations. The means and standard deviations are as follows: Internship expectations ($M = 2.51; SD = 1.10$), social expectations ($M = 2.31; SD = .62$), and career expectations ($M = 2.04; SD = .56$).

Participants were asked to write what they enjoyed the most and liked the least about the AMSRIP. Of the participants, 46 of 51 responded to four top categories. Twenty of the 51 participants indicated that research was what they enjoyed while 19 of 51 participants indicated diversity of people/friends. 4 of 51 participants listed the college experience, and 3 of 51 participants enjoyed the social activities. Since research was the main focus of the program, students worked with faculty members and graduate students on a variety of research projects. The selected interns are geographically located throughout the United States. Therefore, everyone brings different cultures, attitudes and beliefs to the program, which symbolizes a melting pot of diversity within itself. Students also listed that they enjoyed the stipend, freedom, and being able to see and learn new things.
Table 15. Respondents' perceptions of overall expectations

<table>
<thead>
<tr>
<th>Did the program meet your</th>
<th>Did not meet my expectations f (%)</th>
<th>Met my expectations f (%)</th>
<th>Exceeded my expectations f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internship expectations</td>
<td>3 (5.9)</td>
<td>25 (49.0)</td>
<td>22 (43.1)</td>
</tr>
<tr>
<td>Social expectations</td>
<td>4 (7.8)</td>
<td>27 (52.9)</td>
<td>20 (39.2)</td>
</tr>
<tr>
<td>Career expectations</td>
<td>7 (13.7)</td>
<td>35 (68.6)</td>
<td>9 (17.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did the program meet your</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internship expectations</td>
<td>2.51</td>
<td>1.10</td>
</tr>
<tr>
<td>Social expectations</td>
<td>2.31</td>
<td>0.62</td>
</tr>
<tr>
<td>Career expectations</td>
<td>2.04</td>
<td>0.56</td>
</tr>
</tbody>
</table>

*N=51*
There are always things that participants dislike about any program. Respondents listed items they liked least about the program. Nine of 51 participants stated they found nothing they disliked about the program, while 9 of 51 participants did not like the attitudes of other participants in the program. They indicated that a lack of communication existed between the mentors, the resident assistants, and the interns. 7 of 51 participants disliked the rules; they insisted the rules were too strict. Others indicated they disliked the activities, the dorms and the dining hall food. The social activities selected provided a variety of things to do, from visiting Iowa landmarks, such as the Jordan House, to attending a semi-professional baseball game. A natural part of the college experience is living in the dorms and eating in the dining hall on campus. The presentation, length of the program, admitting high school interns, and working were other items listed that participants least enjoyed about the AMSRIP.

Participants were also asked to list the 3 most useful things they learned during the program (refer to Tables 16, 17, and 18 for a detailed list of items). Twenty (43%) indicated the research/laboratory experience was the most useful thing learned during the program. Preparing the PowerPoint presentation, 6 (12%), and cultural awareness, 5 (10%), were the next highest ranked items.
Table 16. Respondents' 1st choice of useful things they learned*

<table>
<thead>
<tr>
<th>Responses</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research/lab experience</td>
<td>22 (43.1)</td>
</tr>
<tr>
<td>PowerPoint presentation</td>
<td>6 (11.8)</td>
</tr>
<tr>
<td>Cultural awareness</td>
<td>5 (8.2)</td>
</tr>
<tr>
<td>Agricultural career exploration</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>College experience</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>No response</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>Social skills</td>
<td>2 (3.9)</td>
</tr>
<tr>
<td>(ISU)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Time management</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Living in dorms</td>
<td>1 (2.0)</td>
</tr>
</tbody>
</table>

* N=51

* Totals do not add up to 100%

Table 17 represents the respondents' 2nd choice of useful things learned. Sixteen (31.4%) of the students learned the importance of cultural diversity. Six (11%) of the students did not indicate a second response. While five (8.2%) learned how to prepare for presentations as well as learning the history and majors available at ISU.

Table 17. Respondents' 2nd choice of useful things they learned*

<table>
<thead>
<tr>
<th>Responses</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural diversity</td>
<td>16 (31.4)</td>
</tr>
<tr>
<td>No response</td>
<td>6 (11.8)</td>
</tr>
<tr>
<td>Presentation skills</td>
<td>5 (8.2)</td>
</tr>
<tr>
<td>(ISU)</td>
<td>5 (8.2)</td>
</tr>
<tr>
<td>Independence skills</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>Computer skills</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>Communication skills</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>Open-minded</td>
<td>2 (3.9)</td>
</tr>
<tr>
<td>Be away from home</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Spending money wisely</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Teamwork</td>
<td>1 (2.0)</td>
</tr>
</tbody>
</table>

* N=51
Table 18 represents the respondents' 3rd choice of useful things learned. Thirteen (25.5%) of the students learned about the various career opportunities available in agriculture-related areas. Twelve (23.5%) chose not indicate a third response and eight (15.7%) selected research.

Table 18. Respondents' 3rd choice of useful things they learned

<table>
<thead>
<tr>
<th>Responses</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career opportunities</td>
<td>13 (25.5)</td>
</tr>
<tr>
<td>No response</td>
<td>12 (23.5)</td>
</tr>
<tr>
<td>Research</td>
<td>8 (15.7)</td>
</tr>
<tr>
<td>Adaptability</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>Agriculture areas</td>
<td>5 (8.2)</td>
</tr>
<tr>
<td>Communication skills</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>Diversity</td>
<td>2 (3.9)</td>
</tr>
<tr>
<td>(ISU)</td>
<td>2 (3.9)</td>
</tr>
<tr>
<td>Computer</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Plane ride</td>
<td>1 (2.0)</td>
</tr>
</tbody>
</table>

N=51

Objective 3. To identify key factors that influenced students not to major in agriculture.

The researcher was interested in how many of these students were currently attending college. If so, where were they attending college, what was major program of study, and if the internship discouraged or encouraged them to major in agriculture.

At the time of the study, over 48 (94.1%) participants reported that they were enrolled in formalized education. A majority of the participants, 44 (86.3%) were attending college.

For this study, college is also inclusive of community colleges, as well as universities.
(7.8%) of the 51 participants indicated they attended high school and only 3 (5.9%) of the participants indicated they were no longer attending school.

Table 19. Participants education level at the time of the study

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>44 (86.3)</td>
</tr>
<tr>
<td>High school</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>Neither</td>
<td>3 (5.9)</td>
</tr>
</tbody>
</table>

*N=51

Participants reported their classification in school at the time of the study. Thirty-six (70%) were enrolled as undergraduate level college students. Eight (16%) participants were classified as graduate students, and 4 (7.8%) were high school students.

One of the goals of the internship program is to introduce minority students to agriculture-related areas and hopefully encourage them to consider majoring in an agriculture-related area (see Table 20). Twenty-nine (56.9%) of the participants indicated that the program encouraged them to major in agriculture-related areas, while 21 (41.2%) indicated that the program did not encourage them to major in agriculture-related areas.

Table 20. Respondents encouraged to major in an agriculture-related area

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>29 (56.9)</td>
</tr>
<tr>
<td>No</td>
<td>21 (41.2)</td>
</tr>
</tbody>
</table>

*b No Response

I didn't necessarily apply to the program for its emphasis on agriculture, but rather for the opportunities related to the field (yet not the field). I enjoyed my time at Iowa State, but in comparison to the other institutions I am able to attend, ISU would never really be one of my options.
The program was effective in encouraging interest in agriculture but the emphasis wasn't imposing with a marginal interest in pursuing a career in agriculture, I wasn't affected too greatly by the push towards attending ISU or changing my mind towards a career in agriculture. Latino female, 19

After the program, I chose to stick with science. I plan to earn a PhD instead of going to law school...African American female, 23yrs. of age

Respondents indicated they were influenced to major in an agriculture-related area due to personal interests (69%), advisors (22%), and family members (16%). Respondents were allowed to circle more than one response. Therefore, cumulative percentages do not equal 100%.

Table 21. Respondents influenced to major in an agriculture-related area*

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal interest</td>
<td>35 (69)</td>
</tr>
<tr>
<td>Advisor/guidance counselor</td>
<td>11 (22)</td>
</tr>
<tr>
<td>Family members</td>
<td>8 (16)</td>
</tr>
<tr>
<td>Vocational agriculture teacher</td>
<td>5 (9.8)</td>
</tr>
<tr>
<td>4-H/FFA organization</td>
<td>5 (9.8)</td>
</tr>
<tr>
<td>Community</td>
<td>3 (5.9)</td>
</tr>
</tbody>
</table>

* Percentages do not add up to 100%, respondents were encouraged to select all that apply

A number of factors could also discourage minority students from majoring in an agriculture-related area. Participants were asked to select from a list of statements that could possible discourage them from majoring in an agriculture-related area. Sixteen (31.4%) participants found the subject area uninteresting, while 14 (27.4%) participants indicated they were discouraged due to the lack of information concerning employment opportunities. The
data also revealed 4 (7.8%) participants indicated a lack of money in the profession and stereotypes of minorities in agriculture were not major discouraging items.

Table 22. Respondents discouraged from majoring in an agriculture-related area

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject area uninteresting</td>
<td>16 (31.4)*</td>
</tr>
<tr>
<td>Lack of information concerning employment opportunities</td>
<td>14 (27.4)</td>
</tr>
<tr>
<td>Lack of minority role models</td>
<td>6 (11.8)</td>
</tr>
<tr>
<td>Lack of money in profession</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>Stereotype of minorities in agriculture</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td></td>
<td>16 (31.4)</td>
</tr>
</tbody>
</table>

* Cumulative percentages do not add up to 100%; respondents were encouraged to select all that may apply.

b No response

The internship was a great opportunity to see some of the stereotypes about minorities prove wrong. Asian American female, 20 years of age

Objective 4. To determine if the program characteristics and demographic variables influenced the learning experience.

During the program, a detailed calendar is developed with all interns' activities for the summer. This calendar includes scheduled meetings, weekly seminars, and social activities. Participants were asked to rank in order of importance the components of the program (see Table 23).

Table 23. Respondents' items of importance

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research experience</td>
<td>5.00</td>
</tr>
<tr>
<td>Diversity make-up of interns</td>
<td>3.57</td>
</tr>
<tr>
<td>Gaining independence</td>
<td>3.50</td>
</tr>
<tr>
<td>Cultural activities</td>
<td>3.09</td>
</tr>
<tr>
<td>Social activities</td>
<td>3.02</td>
</tr>
<tr>
<td>Diversity make-up of university</td>
<td>2.82</td>
</tr>
</tbody>
</table>
Students gained a variety of skills while attending the program. Research, personal development skills, such as gaining independence, social skills, and adaptability were a few of the skills mentioned in this category. Communication skills were reported most frequent.

The internship program provided knowledge about various subject areas. For example, seminars were presented on career opportunities in agriculture-related areas, learning how to prepare formal presentations utilizing PowerPoint software while mentors provided assistance to interns in writing their research papers, and hands-on experience learning activities. Participants indicated they gained knowledge about career opportunities in agriculture 43 (84.3%) and hands-on experience 41 (80.4%). Participants were less likely to gain knowledge in the area of job seeking skills, 18 (35.3%) and how to prepare academically for higher education, 28 (55%). Refer to Table 24.

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career opportunities in agriculture</td>
<td>43 (84.3)</td>
</tr>
<tr>
<td>Hands-on learning experiences</td>
<td>41 (80.4)</td>
</tr>
<tr>
<td>Writing research papers</td>
<td>38 (74.5)</td>
</tr>
<tr>
<td>Preparing formal presentations</td>
<td>35 (68.6)</td>
</tr>
<tr>
<td>General information about applying for higher education</td>
<td>33 (64.7)</td>
</tr>
<tr>
<td>Preparing academically for higher education</td>
<td>28 (55.0)</td>
</tr>
<tr>
<td>Job seeking skills</td>
<td>18 (35.3)</td>
</tr>
</tbody>
</table>

Respondents selected different skills they learned during the program. Forty (78%) students learned how to work with others, thirty-nine (76%) indicated communication, and twenty-nine (56.9%) learned essential work habits. All of the categories represent pre-professional skills needed.
Table 25. Respondents' perceptions of skills learned

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to work with others</td>
<td>40 (78.4)</td>
</tr>
<tr>
<td>Ability to communicate effectively</td>
<td>39 (76.5)</td>
</tr>
<tr>
<td>Effective work habits</td>
<td>29 (56.9)</td>
</tr>
<tr>
<td>Decision making skills</td>
<td>29 (56.9)</td>
</tr>
<tr>
<td>Critical thinking skills</td>
<td>28 (55.0)</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>27 (53.0)</td>
</tr>
</tbody>
</table>

Conducting and learning research is the main focus of the AMSRIP. Participants work with faculty mentors and graduate students to understand research. Students had the opportunity to choose their top three selections from a list of 20 departments within the College of Agriculture, College of Family and Consumer Science, and the United States of Agriculture National Animal Disease Center. During the last week of the program, participants are asked to evaluate the research subject chosen. Table 26 represents how students enjoyed or disliked the subject area of interest. A majority of the participants, 42 (82.3%), found their research exciting. Eight (16%) participants found the research boring, difficult to understand, or not challenging enough.

Table 26. Respondents' perceptions of the research subject area studied

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciting</td>
<td>42 (82.3)</td>
</tr>
<tr>
<td>Boring</td>
<td>8 (16.0)</td>
</tr>
<tr>
<td>Difficult to understand</td>
<td>8 (16.0)</td>
</tr>
<tr>
<td>Not challenging enough</td>
<td>8 (16.0)</td>
</tr>
</tbody>
</table>

Faculty mentors are expected to work with students, providing hands-on learning experiences and research-related resources during the course of the internship. Participants
agreed that the mentors were helpful. 43 (84.3%), while only 3 (5.9%) participants indicated that their mentors were difficult to work with or never around (see Table 27).

... The only comment that I have is that when choosing professors for mentors, that they are available for the summer. My personal experience was that for the most part, I created my own research project. This actually turned out to give me valuable experience for my graduate work but I think the point was to learn from a mentor. African American female, 25

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpful</td>
<td>43 (84.3)</td>
</tr>
<tr>
<td>Resourceful</td>
<td>43 (84.3)</td>
</tr>
<tr>
<td>Difficult to work with</td>
<td>3 (5.9)</td>
</tr>
<tr>
<td>Never around</td>
<td>3 (5.9)</td>
</tr>
</tbody>
</table>

**Objective 5. To identify students’ perceptions regarding the usefulness of the research internship program in contributing to their future career and college major selection.**

As a result of the interns’ research experience, over half. 27 (52.9%), of the participants reported they were involved with agriculture-related activities. The other 24 (47.1%) participants noted they no longer were involved with agriculture-related activities (see Table 28).

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>27 (52.9)</td>
</tr>
<tr>
<td>No</td>
<td>24 (47.1)</td>
</tr>
</tbody>
</table>
Twenty (39.2%) of the interns are involved in agriculture-related activities through school functions (see Table 29).

Table 29. Capacity in which respondents were involved in agriculture-related activities

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School (high school/college)</td>
<td>20 (39.2)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (15.7)</td>
</tr>
<tr>
<td>Community</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>Job</td>
<td>4 (7.8)</td>
</tr>
<tr>
<td>4-H/FFA</td>
<td>2 (3.9)</td>
</tr>
</tbody>
</table>

Over 86.3% of the participants reported they were not employed in agriculture-related positions during the time of the study, while only 7% reported working in this area (see Table 30).

Table 30. Number of interns in agriculture-related positions

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>44 (86.3)</td>
</tr>
<tr>
<td>Yes</td>
<td>7 (13.7)</td>
</tr>
</tbody>
</table>

Respondents indicated if the internship experience encouraged them to pursue a career in agriculture. Over half, 26 (51%), of the participants responded that the internship experience did not encourage them to pursue agriculture careers. Twenty-five (49%) participants agreed that the internship experience encouraged them to pursue agriculture careers (see Table 31).
Table 31. Respondents encouraged to pursue agriculture-related careers

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>26 (51)</td>
</tr>
<tr>
<td>Yes</td>
<td>25 (49)</td>
</tr>
</tbody>
</table>

Objective 6. To identify factors that enhanced and inhibited minority student recruitment and retention at Iowa State University, particularly within the College of Agriculture.

As interns completed a six or eight week research internship at Iowa State University, numerous perceptions about the internship program, Iowa State, and the Ames, Iowa community were formed. Respondents were asked to indicate if the program made them more likely, less likely, or neither in regards to attending Iowa State University. Participants responded using qualitative information.

Table 32. Possible recruitment of former interns to Iowa State University

<table>
<thead>
<tr>
<th>Item</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More likely</td>
<td>30 (58.8)</td>
</tr>
<tr>
<td>Neither</td>
<td>16 (31.4)</td>
</tr>
<tr>
<td>less likely</td>
<td>5 (9.8)</td>
</tr>
</tbody>
</table>

Great program. I loved my time there. I will be applying to grad school at Iowa. Without the program I would not have known about ISU. Asian American Male, 21

I really did enjoy my stay at Iowa State University and I am more than willing to tell some of the students in my school about the program. I am also thinking about going to graduate school in Iowa. Latino female, 18
Past interns decided they would be less likely to attend Iowa State University because they experienced isolation within their department. replied the institution was not as diverse. the environment and social atmosphere were not acceptable and they wanted to attend a historically black college or university (see Table 32). Participants were also asked to rank barriers or state reasons that would hinder their decision to attend ISU (see Table 33).

Overall I believe that this is a good recruiting program. African American Male. 23

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortage of minorities in Ames</td>
<td>5.0</td>
</tr>
<tr>
<td>Demographics (location/expensive travel)</td>
<td>4.1</td>
</tr>
<tr>
<td>Climate</td>
<td>3.7</td>
</tr>
<tr>
<td>Cultural differences</td>
<td>3.2</td>
</tr>
<tr>
<td>Lack of personal accommodations</td>
<td>3.1</td>
</tr>
</tbody>
</table>
CHAPTER V. SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

This chapter will provide a summary of the study, make conclusions based on the findings of the study, and offer recommendations for further research on the Agriculture Minority Summer Research Internship Program at Iowa State University. The chapter will include sections on: (a) purpose, (b) objectives, (c) methods, (d) findings, (e) conclusions, and (f) recommendations.

Purpose

The primary purpose of this study was to evaluate the impact of the experiences high school and undergraduate students received while attending Iowa State University's Agriculture Minority Summer Research Internship Program. A second purpose of this study was to assess the effectiveness of the Agriculture Minority Summer Research Internship program as a recruitment and retention tool.

Objectives

The specific objectives of the study were:

1. To determine the factors that influence participants to apply for the program.

   Students were interested in applying to the program to gain research experience, earn a stipend/paycheck, and get a paid trip away from home.

2. To understand if the students' expectations were met or exceeded.

   According to the respondents' student expectations were met and in some areas exceeded.
3. To identify key factors that influenced students not to major in agriculture.

   Respondents indicated they were discouraged from majoring in agriculture due the uninteresting subject matter, and the lack of information concerning employment opportunities and the lack of minority professionals within agriculture-related areas.

4. To determine if program characteristics and demographic variables influenced the learning experience.

   Respondents were interested in research, diversity make-up of interns and participation in cultural and social activities while participating in the AMSRIP.

5. To identify students' perceptions regarding the usefulness of the research internship program in contributing to their future career and college major selection, and

   Most respondents are still involved in agriculture-related activities after attending the AMSRIP. Most are affiliated with school (high school/college) activities.

6. To identify factors that enhanced or inhibited minority student recruitment and retention at Iowa State University within the College of Agriculture.

   Shortage of minorities, demographics and climate in Ames inhibited minority students from attending ISU.

Methods

This study was conducted utilizing a descriptive survey design. The accessible population of this census study consisted of 60 former Agriculture Minority Summer Research interns who completed a minimum of one summer at Iowa State University between the years of 1998-2001. Current addresses of the interns were obtained from Agriculture Minority Programs at Iowa State University. Due to the geographic locations of
participants, the researcher chose to collect data from former interns by utilizing self-administered surveys. A total of 51 interns (85%) completed and returned the survey.

The survey itself consisted of six sections plus demographic information and ten open-ended questions that provided qualitative information. The sections were as follows: (1) Applying to the program, (2) Student expectations, (3) Majoring in agriculture-related subject, (4) The learning experience, (5) Agriculture involvement, and (6) Recruitment/Retention.

The data collected from the participants were coded, entered, and analyzed using the Statistical Product and Service Solutions formally known as the Statistical Package for the Social Sciences, SPSS (George & Mallery, 2001). The statistical procedures used included frequencies, means, standard deviations, and rankings to obtain findings.

Findings

Descriptive statistics were utilized to summarize characteristics of respondents. This information is presented concerning respondents according to gender, age, ethnicity, and education.

The following analysis of data is presented based on the respondents’ answers to the survey instrument. The major findings of this study are:

1. According to the demographic characteristics reported, females accounted for (62.7%) of the interns where as (37.7%) were males completed the Agriculture Minority Summer Research Internship Program.
2. Respondents' ages ranged from 16-34 years of age. Twenty-six (51%) of the interns indicated an age of 20 years or less, while 25 (49%) of the interns indicated an age of 20 years or above.

3. The ethnicity of interns was 25 (49%) African American, 11 (21.6%) Asian Americans, 9 (17.6%) Latino/Hispanic, and 6 (11.8%) Native American/American Indians.

4. The highest level of education completed for the most interns was 34 (66.7%) high school graduates. Fourteen (27.5%) of interns had completed a bachelor's degree while 3 (5.9%) had completed associate degrees.

5. Twenty-one (41.2%) of the interns indicated they found out about the Agriculture Minority Summer Research Internship Program by utilizing the World Wide Web, email, and friends. Other participants indicated that they heard of the program from schoolteachers (25.5%) and guidance counselors (15.7%).

6. Of the 51 participants, 48 (94.1%) of the interns indicated that they applied to the internship program to gain research/educational experience.

7. Participants were asked if they had any knowledge of agriculture prior to attending the AMSRIP. Sixty-eight percent (68.8%) of the participants had some knowledge of the agriculture-related information prior to attending the AMSRIP. As a result of attending the program (82.3%) of the participants agreed that their knowledge base of agriculture had broadened.

8. Student expectations were divided among four sections: 1) internship expectations, 2) social expectations, 3) career expectations, and 4) overall expectations. Internship expectation means ranged from 1.82 to 3.61. Interns
indicated that they expected to take part and complete a research project while attending the internship program. Students indicated that they were not expecting to work on a farm or take classes during their internship experience. All 51 of the respondents strongly agreed or agreed that they expected to meet new friends as a part of their social expectations. In the career expectations section, interns were expecting to meet minorities and interact with those working in or pursuing agriculture careers. Scores ranged from 2.98 to 3.41 for the career expectations. The overall student results for internship expectations were 2.51, social expectations 2.31, and career expectations 2.04.

9. Participants indicated that they were discouraged from majoring in an agriculture-related area. Thirty-one percent (31.4%) considered the subject area uninteresting and (27.4%) received a lack of information concerning employment opportunities.

10. Participants reported that they gained research, communication and independence skills as a result of attending the internship program. Interns also gained knowledge about various subject areas in agriculture-related areas. Eighty-four (84.3%) participants indicated they gained knowledge about career opportunities in agriculture and (80.4%) gained hands-on experience-experiential learning.

11. As a result of the interns' research experience, over (52.9%) of the participants reported that they were involved with agriculture-related activities. Fifty-one percent of the respondents' indicated that the internship experience did not encourage them to pursue agriculture-related careers while the other (49%) agreed that the internship experience encouraged them to pursue agriculture-related careers.
12. In addition to the research experience, the program hopes to encourage recruitment and retention of minority students particularly in agriculture. Former interns' were asked if they were more likely, less likely, or neither to attend ISU. Over fifty percent (58.8%) participants reported they were more likely to attend ISU while only (9.8%) indicated they were less likely to attend and (31.4%) chose neither as a selection choice, indicating that the internship program did not encourage or discourage them from attending ISU.

Conclusions

Based on the findings of this study, the following conclusions were made:

1. The results of this study can only be generalized to the 51 participants who responded to the survey not all 94 of the former interns.

2. Demographic characteristics of the respondents reflected those who have attended at least one summer of the Agriculture Minority Summer Research Internship Program during the 1998-2001 years at Iowa State University in the College of Agriculture. This program was designed and implemented under the direction of the Agriculture Minority Programs.

3. Respondents were interested in attending the AMSRIP to gain research/educational experience. Interns' expected to be involved in experiential learning activities as they prepared their research projects. This experiential learning approach allowed the participants to actively assist in conducting research during the learning process.
4. Respondents agreed they learned various skills throughout the internship program and had the opportunity to utilize what they learned at the program as well as at their home institutions. Overall the respondents’ had a positive perception of the Agriculture Minority Summer Research Internship Program. This was also reflected in the participant comments. See Appendix C.

5. Little information was available on the history and details of the Agriculture Minority Summer Research Internship Program. The researcher intends to share the findings of this research and hope this study will provide a permanent historical starting point for the Agriculture Minority Summer Research Internship Program.

Implications

Implications can be drawn from this study and applied to the Agriculture Minority Summer Research Internship Program. The findings of this study along with the review of literature give importance to minority internships as well as experiential learning, career exploration, and recruitment and retention. Each section mentioned is an integral part of the internship experience. Internship programs are becoming a more common practice, as students acquire the necessary skills to work in a given area. Within the Department of Agriculture Education and Studies, Iowa State University, Agriculture courses #211, #412, and #418 are a requirement for undergraduate students (Jones, 2000). Miller (2001) states that experiential learning serves as the link between the classroom and the real world. This allows students to acquire skills and knowledge simultaneously.
The Agriculture Minority Summer Research Internship data implies that more minority females have participated in the internship program, however, the internship program has been able to recruit and retain more minority males. As the number of women and minorities continue to increase in agriculture the program will likely increase in numbers. It is imperative that the program continue to recruit male and female interns, however, a greater emphasis should be placed on recruiting and retaining female undergraduate and graduate students. The researcher recommends that the program targets this area of recruitment and partner with other campus internship programs, such as, “Women in Science and Engineering.” to model their recruitment and retention initiatives.

Results of the study implied that most of the interns received their prior knowledge of agriculture from educational settings. very few chose agriculture youth organizations. Early intervention programming would target more minority youth. Emphasis should be placed on educational curricula to incorporate agricultural history, ideas, innovations, and concepts with youth. By communicating the importance of agriculture-related information at an early age (primary and secondary school age). students would become curious and begin to seek information in this area. Introduction to agriculture can also be delivered in non-formal settings such as Extension Education. Agricultural youth organizations such as 4-H and FFA can also be introduced. As a part of on-campus recruiting efforts, MANRRS along with other student organizations could host field days, inviting students to explore agriculture-related majors (Dwyer, 1975).

Agriculture in the Classroom (AITC) is another program educators can use to create an awareness of the role of agriculture in the economy and society. Since 1981, this program provides information on teacher resources, state programs, a kid’s corner, and information on
This educational program was designed to supplement and enhance the already existing curriculum. This program is sponsored by the United States Department of Agriculture (USDA) and is utilized in every state, according to the state needs and interests. Individuals from farm organizations, agribusiness, education, and government assist with resource materials for this web based site (http://www.agclassroom.org/).

In order to continue hosting a program such as Agriculture Minority Summer Research Internship, a strong departmental commitment must be maintained. Fog (1980) contends that in order for an internship program to be successful an administration that believes in the worth of the program, committing financially and a faculty supportive of such internship programs must exist. Iowa State University is becoming more diverse and is attempting to become more inclusive of all individuals. This minority internship not only strengthens the College of Agriculture, but also the university and society at large, as well.

“Diversity education as a priority requires its implementation through the institution in its mission, goal, procedures, education initiative, faculty and student development” (Thomas-Gallet, 1998).

Due to cutbacks in the Agriculture Minority Program as well as the with university campus, reductions in enrollment and extra-curricular activities have been occured. Outside funding sources have also had to discontinue their financial assistance. It is essential that the College of Agriculture continue to support this program, promoting higher education awareness among minorities in agriculture-related areas.

Faculty serve as mentors during the summer internship program, providing direction, advice, and supervision of interns. In the study participants indicated that mentors were mostly helpful and resourceful. The faculty mentor makes a commitment to assist the
student with their research projects and their oral and written presentations based on their research conducted during the internship program. Faculty members serve as role models within the discipline. Students success in college can be attributed to the role faculty advisors play (DelCampo, Soto-Fulp, and DelCampo. 1996). The researcher chose not to focus on faculty mentors but on outcome benefits to the students. In the future, follow-up evaluation could be conducted with faculty who have served as mentors throughout the program. Faculty are an important part of the internship program, without them research as well as funding sources would not be available.

Participants gained numerous skills from attending the internship program according to the data. Communication skills (oral and written) were reported as the most frequent skills learned during the internship program. Research and personal development skills were also mentioned. Participants learned how to write research papers and present their research projects during an open forum. Most interns learned to utilize PowerPoint to present their information. These skills prepare interns for professional presentation, increase their academic potential and prepare them for future employment.

Thus far. the outcomes of the Agriculture Minority Summer Research Internship Program have directly benefited the interns. Participants have had the opportunity to receive free airfare, room and board, social activities, and be paid stipends to participate in the internship program. Besides these monetary benefits, students have also received immeasurable experiences such as becoming independent, making lasting friendships, and working with culturally diverse individuals. These experiences are priceless. Students’ comments listed in the Appendix share brief accounts of how important the skills learned in the program have been for its participants. The Agriculture Minority Summer Research
Internship Program also benefits from hosting such a program. Even though the program has only been in existence for seven years, a Return on Investment (ROI) exits. Of the sixty former interns who participated in the study, 9 (15%) were enrolled at Iowa State University during the 2001-2002 academic year. As of August 2002 the ROI will at least rise to 18%. Two addition students have been accepted and plan to attend. Since enrolling at Iowa State University, these students have become actively involved with the institution. They have enrolled in the Agriculture Minorities Empowered for Success (AMES) learning community, joined Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS), served as Resident Assistants (RAs) in the residence hall for the summer internship program, and served as role models for newly enrolled minority recruits.

This program will eventually achieve a higher ROI. Many of these minority students are aspiring to become professionals within agriculture-related areas. Later these same interns will be contributing back to Iowa State University and the society at large. These former interns will be serving as faculty, staff, and role models encouraging other minority students to enter the agriculture profession. The researcher suggests that continuous follow-up of the interns be completed on a yearly basis to reflect on experiential learning. Therefore, it is imperative to enhance the record keeping of the program by incorporating a permanent database. This database will contain contact information on each student, thus allowing access to general demographic information. For example, their current address, institution(s) attended, selected major and/or current profession. This information will be essential for evaluating the long-term effects of the AMSRIP.

To enlighten prospective interns about their upcoming summer research experiences at Iowa State University, it is recommended that past interns communicate with these new
students. Past participants could call or email the perspective interns about the program. These former participants could answer specific questions relating to minority student life at ISU and based on their personal experiences. When former participants serve as role models for the new minority students, past participants remain affiliated with the progressive development of the Agriculture Minority Summer Research Internship Program.

It is recommended that the program, continue to provide a wide variety of academic and social activities, particularly on weekends. As a result of the study, the researcher suggests an increase in the career component. Hold one weekly evening seminar with professionals from agriculture-related occupations. These speakers can inform students of the opportunities available within their companies and their personal work-related experiences. Students will have a chance to communicate by asking questions and participating in a small group setting. This could also open some networking chains to provide outside corporate and small business funding sources. It would also be recommended that students have a chance to tour their facilities if time and interest permits. Ingram (2001) stated incorporating mini-diversity experiences into the program prepares students for the increasingly diverse workforce.

Recommendations

As a result of the findings listed in Chapter 4, the researcher has provided specific recommendations for additional selected items. These items target specific suggestions for the program mentioned by former participants. The items are listed categorically, according to related themes and are in no particular order. The program should take into consideration
the following recommendations to enhance the overall Agriculture Minority Summer Research Internship Program.

**Student Enrollment**

- Finding-Representation from over 23 colleges/universities and 15 high schools.
- Finding-Participants encouraged to attend because of personal interests, advisors, and family members.

Participants have been selected to attend the program from institutions located throughout the United States. Personal interest, advisors, and family members were influential in student's choice to attend the internship program. The program should continue sending information to high schools and universities, establishing rapport with advisors and teachers. It is highly recommended that Agriculture Minority Programs begin informing more parents about the internship program and the benefits offered. Information on the program can be made available through Parent Teacher Association (PTA) and by holding a parent-student seminar on-campus highlighting the AMSRIP.

The enrollment will continue to rise, as more people become aware of the internship program. However, the program needs to have a formalized database in place. This permanent database would allow the Agriculture Minority Office, the AMSRIP, as well as the MLO to locate and make contact with former interns. Interns should be contacted annually to fill-out a personal data information sheet with their current address, educational or employment status. The program could also solicit advice and/or ask the ISU Office of Institutional Research to organize and maintain such a database. This type of information would be most resourceful in tracking students and having numbers available to apply for funding.
Research

- Finding-Research skills were the most important skills learned.
- Finding-Participants indicated that the subject matter was uninteresting, boring, and difficult to understand and not challenging enough.
- Finding-Participants did not like to work during their internship experience.

Overall the participants enjoyed their learning experience, while a few did not enjoy some components of the research experience. The internship program requires that the interns work no more than 40 hours per week. Most of the interns usually work about 30 hours due to scheduled seminar meetings and afternoon tours. Students choose which area they wanted to work in before coming to the program. Make sure both high school and undergraduate interns are aware of program requirements prior to attending the program and re-emphasize them during the orientation workshop. The internship provides students with choices and this internship allows students the chance to evaluate if this particular area would be of interest for a major college or possible future career. Encourage students to select subject matters of interest to them and not their parents. Inform mentors to make their research projects creative, appealing, and interesting for first time researchers, whether high school and undergraduate students. If problems arise, have students talk with mentors and program coordinator.

Career

- Finding-Respondents wanted to explore career options during free time and called for information on job seeking skills.
- Finding-Respondents expected to meet minorities in the profession and interact with other agricultural professionals.
- Finding-Participants were discouraged by a lack of information concerning employment opportunities, lack of minority role models, and the lack of information received on preparing for higher education.
- Finding-Participants were not encouraged to select a career in agriculture as a result of attending the internship program.
According to respondents comments the career component of the program should be strengthened. Students wanted more information on agriculture careers and wanted to interact with minority role models and other professionals. It is recommended that the program encourage minority faculty within the College of Agriculture, the Agriculture Diversity Committee and other professionals who share an interest in diversity become involved with the program. The program should allow students to visit the agriculture career office on campus to locate and discuss information on perspective agriculture careers. In addition to the admissions office discussing information on ISU, the undergraduate students can discuss with the high school students exactly what they need to do to prepare for higher education.

**Diversity**

- Finding-Respondents agreed that they expected to meet new friends.
- Finding-Participants wanted to experience diversity/cultural awareness.
- Finding-Lack of communication existed between mentors, RAs, and interns.
- Finding-Participants did not like the attitudes of other interns in the program.

Participants in the program are diverse in numerous ways. As a group, they form bonds and friendships throughout the course of the internship program. However, students wanted to experience that same diversity on-campus as well. It is recommended that more group or teamwork activities be added to the program agenda for evening and weekend sessions. This would allow students to work in small groups and have open dialogue to avoid negative attitudes and behaviors of group members. Form activities with other summer minority programs to enhance diversity. Relationships formed during the internship program are essential for recruiting students to ISU.
Campus

- Students wanted to learn more about Ames and ISU.
- Participants stated that ISU not diverse.
- The environment and social atmosphere were not acceptable for some interns.

Although the number of minorities within the Ames community is small, it is recommended that students become familiar with the minority organizations that are available. The program coordinator can encourage and arrange for students to get involved with community activities (church, public library activities) to meet others in the community and get a sense of connectedness. The program can invite college students and former interns to take part in some social activities and show students around town hangouts such as campus town. This builds rapport amongst students creating mentor-mentee relationships as well as friendships.

Suggested Program Changes

- Finding-Participants indicated that program rules were too strict.
- Finding-Participants did not agree with the length of the program, eating in the dining hall, and living in the residence hall.
- Finding-Participants suggested that the program not accept high school students.

Some participants did not like living on-campus in the residence hall and eating in the dining hall. These are both a part of the college experience for most students. By living on-campus in the residence, allows students' access to campus buildings and facilities needed throughout the summer experience. It is also important that students meet and communicate with other students. High school students agreed that the program rules are too strict. They are given curfew hours mostly because they are under age and are not allowed to do some of the things the undergraduates can do. Since most high school interns are between 16-18 years of age, they are not as mature nor have they had the experiences most undergraduate
students have. The high school students are under age and the program is responsible for their actions. A few undergraduates implied that high school students have no sense of direction and should not be allowed to attend the internship program.

Since both high school and undergraduate aged students are participating in the program, explicit program rules and activities should be made if both groups are going to act as one overall program. The researcher recommends that the program continue to prepare these students for the college experience by providing room and board on-campus. Undergraduate numbers for recruitment are beginning to rise among former high school participants therefore both age groups are recommended to participate in the ISU AMSRIP.

**Modified Recruitment and Retention Model for Underrepresented Populations**

The researcher chose to modify the recruitment and retention models created by Talbert et al., 1997. Modification was made based on the literature review and the researcher's personal experience in working with the program. See figures 6 and 7.

Several additions and deletions were used to modify the models. The original recruitment model reflected a need to include a positive image of agriculture, however the participants in this study did not perceive a negative image of agriculture. Most institutions require that freshman students live on-campus thus not a necessary requirement for graduate students so this item was not used in the modification as well.
Figure 6. Modified Model for recruitment of students from underrepresented populations.

The modification of the recruitment model involves adding family to the personal contact list. Family members played a significant role in assisting the student with school related advise. Along with the admissions office, the Minority Liaison Officer (MLO) for each college should communicate with parents as well. They can inform parents about the university and how their office will assist in making the minority students transition a success.
Recruitment fairs are needed for the AMSRIP to become more visible. Visits to local and other in-state high schools with a minority population in Iowa should be targeted for recruitment. The Office of Agriculture Minority programs should continue providing campus visits for prospective students and parents. This allows them to see and ask questions pertaining to the internship program as well as the university.

A learning community component was also added. Learning communities allow students with similar interests and/or majors to form bonds as a small community within a university. Some learning communities require that students live together, take the same courses and interact in social activities.

Learning communities are used in various departments at ISU. The College of Agriculture has thirteen learning communities, more than any other college at ISU. They began in 1996 for first year undergraduates, to reduce drop-out rates and improve academic performance. Colleges can design learning communities for their departments, relying on their needs, interest and creativity of the program coordinators/faculty members. The overall grade point averages have improved along with retention rates of first year students (http://www.public.iastate.edu/~learncommunity/whatis.html).

Faculty and other undergraduate or graduate students could act as mentors to the incoming students. They can provide guidance on which classes and instructors to take and acclimate students to the campus and surrounding community life. Students should become familiar with the Minority Student Affairs office on their campus and other offices that can provide financial, emotional and academic support. The financial aid office and advisors can provide students with guidance on scholarships, grants, and loans to finance their education. Counseling centers are usually available on campuses to assist with emotional issues. For
example individuals may need assistance with learning how to adjust to college life. All of these services are available at no cost to students.

Career exploration and field trips allow students to explore various career options in the field of agriculture. Students should become familiar with the other departments with the College of Agriculture especially if they have not selected a major. Throughout campuses, computer modules such as Discovery, allow students to access where their strengths and interests lie in looking for future career options.

Figure 7. Modified Model for retention of students from underrepresented populations.
The modified retention model for students from underrepresented populations looks very similar to the recruitment model. See Figure 7. The faculty/student mentors, financial support, the MLOs, career development, academic, emotional, and community support are items that exist in both models. In this model, social/academic activities should be provided. This allows the students a chance to excel and have fun outside of the classroom atmosphere. Now students are in classes and becoming familiar with campus life, it’s time for them to get involved. MLOs, faculty and mentors should encourage students to join department clubs/organizations as well as those of interest, hobbies or just for fun.

A leadership component should be added. Leadership skills prepare students for a professional career and life. Workshops, internship programs, and study abroad programs all allow the students to learn leadership skills. These skills can be used in classes and community.

The researcher modified these programs to fit the Agriculture Minority Summer Research Internship Program at Iowa State University. It is recommended that the program begin to implement these components as a part of their official recruiting and retention program for Agriculture Minority Programs. However, both of these models can be modified to meet the program or university’s needs.

Further Research
Evaluation of the Agriculture Minority Summer Research Internship Program has not been a major concern up until now. The researcher was personally interested in learning about the impact of the Agriculture Minority Summer Research Internship Program having coordinated the program since 1998. This exploratory study is just the beginning of accessing information based on the interns summer research experience. Continued research
of the AMSRIP is needed to further insure the future success of the program. Future topics for research could include: 1) the impact of faculty mentors, 2) enhancing the career exploration section, and 3) education and employment for former interns. The program benefits minority students, the College of Agriculture at Iowa State University, and society as a whole.

Conducting research requires time and resources. Financial assistance was necessary to conduct and distribute this research survey. Therefore, a budget was developed to estimate direct costs of the survey and are necessary for survey research (Salant & Dillman, 1994). Budget issues can affect or hinder research as well as recruiting and retention rates for future minority funding. Indirect costs of the research included the use of building facilities and the researchers' graduate student assistantship. Direct costs for this mailed survey included xerox copies, supplies, postage mailings, and telephone costs to be assumed by the office of Agriculture Minority Programs. As the program continues to grow in numbers, additional staff for secretarial assistance and summer staff will be needed.

This first evaluation focused on the outcomes of the minority interns however future research could be conducted on the faculty mentors. Faculty mentors throughout the campus have worked with the program since it originated. Receiving input from these mentors allows the program to identify how mentors perceive their role and if it is necessary to make adjustments. It is highly recommended that these experiences not end at the close of summer, but continue throughout the academic year. Research has indicated that the student-faculty interaction has positive effects on career outcomes (Austin, 1993). Research projects can be made available to undergraduate and graduate students during the academic year on a voluntary basis. This would prepare other minority students with the Department of
Agriculture to experience conducting research under the direction of faculty members. Students could learn how to conduct research and also have the opportunity to present this information at National conferences such as MANRRS. This would not only help with increasing chances of retaining students because they are actively involved in the campus life, but also preparing the individual students for higher education.

Career exploration was an area that students indicated they would have liked to have received more information. This researcher recommends that communication be established between AMSRIP and agriculture businesses. Corporate businesses incorporated internship programs into their mission several years ago and provide experiences for undergraduate and graduate students. Agriculture businesses are well aware of the total process from hiring, recruiting, training, and retaining outstanding students. For those interested in certain professional agriculture careers, the internship program could arrange job shadowing for a day with a professional, this would be a great way to learn about the prospective job. By spending a day on the job, students could receive direct insight into a particular job. Gordon (1988) contends early agricultural work experiences will assist the student in making the decision as to whether this career is one to pursue or not.

The continuous marketing of the AMSRIP is necessary to enhance enrollment of potential high school and undergraduate students. As reported in the study, the World Wide Web draws a lot of attention from interested participants. Programs experimenting with electronic bulletin boards reported an increase in access to information (Inkster and Ross, 1995). It is recommended that the internship program continue sending information via mail to high school, universities as well as Upward Bound programs. Upward Bound is a federally funded program serving high school students that encourages students to attend
post-secondary education. AMSRIP should continue to track participants to determine if they pursued agriculture-related careers. As time goes on, access to a larger internship population for future studies will include in depth information on possible participants, mentors, and the program goals itself. Current students will have graduated and be well on their way to becoming agriculture professionals.
APPENDIX A.

HUMAN SUBJECTS APPROVAL FORM
Iowa State University Human Subjects Review Form

PF Last Name: Gale
Title of Project: Follow-up Survey of the Agriculture Minority Summer Research Internship Program

Checklist for Attachments

The following are attached (please check):

13. ☐ Letter or written statement to subjects indicating clearly:
   a. the purpose of the research
   b. the use of any identifier codes (names, #s), how they will be used, and when they will be removed—see Item 15
   c. an estimate of time needed for participation in the research
   d. if applicable, the location of the research activity
   e. how you will ensure confidentiality
   f. in a longitudinal study, when and how you will contact subjects later
   g. that participation is voluntary; non-participation will not affect evaluations of the subject

14. ☐ A copy of the consent form (if applicable)

15. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)

16. ☐ Data-gathering instruments

17. Anticipated dates for contact with subjects:
   First contact: 10/01/01
   Last contact: 06/01/02
   Month/Day/Year

18. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:
   Month/Day/Year

19. Signature of Departmental Executive Officer Date
   Department or Administrative Unit

20. Initial action by the Institutional Review Board (IRB):

   ☒ Project approved Date
   ☒ Pending Further Review Date
   ☒ Project not approved Date

   ☒ No action required Date

21. Follow-up action by the IRB:

   Project approved Date
   Project not approved Date
   Project not resubmitted Date

Rick Sharp
Name of IRB Chairperson

Signature of IRB Chairperson Date
APPENDIX B.

SURVEY INSTRUMENT AND CORRESPONDENCE
October 1, 2001

Dear Intern:

You have been selected from our Agriculture Minority Summer Research Internship Program list to take part in a survey about your research internship experience at Iowa State University. Within the next few days, you will receive the survey in the mail. Your participation in the questionnaire is very important.

The survey is being conducted as a follow-up to your research internship experience at Iowa State University. The program is very interested in what you thought about the program.

Your participation in this survey is voluntary, and we would greatly appreciate your taking about 10-15 minutes to answer the questions.

If you have any questions or concerns about the survey, please feel free to contact Nicole’ Gale at 515-294-4519 or ngale@iastate.edu.

Thank you in advance for completing the survey.

Sincerely,

Nicole’ Gale
Nina Grant
B. Lynn Jones
Agriculture Education & Studies
Director, Agriculture Minority Programs
Professor, Agriculture Education & Studies

Doctoral Candidate
Director, Agriculture Minority Programs
Education & Studies
September 24, 2001

Dear Parent,

Your son or daughter has been selected from our Agriculture Minority Summer Research Internship Program list to take part in a survey about their research internship at Iowa State University. The purpose of this study is to examine experiential learning, recruitment/retention and career exploration of former interns. Their participation in the survey is very important.

The survey is voluntary and all information will be confidential. Your written consent is needed for your student to participate in the survey.

__________________________________________  ______________
Parent's Signature                        Date

Please return this form no later than October 22, 2001, enclosed with the student survey if permission is granted to participate.

Sincerely,

Nicole' Gale
Graduate Student
Dear Former Intern:

Two weeks ago you received the survey "Follow-up Survey of the Agriculture Minority Summer Research Internship Program." We have not received your completed survey. If you have already completed the survey and returned it to us, please accept our sincere thanks. If not, please take a few minutes to complete and return the survey today. Your response is very important and is needed to accurately represent the opinions of former interns.

Just in case the original survey was misplaced; another survey is enclosed. There is a code on your survey and the purpose of the code number is to keep track of who has responded. Once you have responded, your name will be removed from the mailing list. Your responses to the survey will be kept confidential.

The survey will take 10-15 minutes to complete and your participation is voluntary. If you have any questions regarding the survey, please feel free to contact me at (515) 294-4519 or ngale@iastate.edu.

Thank you in advance for participating in this survey.

Sincerely,

Nicole' Gale
Agriculture Education & Studies
Doctoral Candidate

Nina Grant
Director, Ag. Minority Programs

B. Lynn Jones
Professor, Agriculture Education & Studies
Follow Up Survey for the
Agriculture Minority Summer Research Internship Program

Please return your completed survey in the enclosed envelope to:

Nicole' Gale
Agriculture Minority Programs
23 B Curtiss Hall
Iowa State University
Ames, Iowa 50011-1050
October 5, 2001

Dear Former Intern:

I am a graduate student at Iowa State University pursuing a doctoral degree in Agricultural Education and Studies. For my research, I am studying the impact of the Agriculture Minority Summer Research Internship Program. The purpose of this study is to examine experiential learning, recruitment/retention and career exploration of former interns. Your participation in the survey is very important.

The survey is being conducted as a follow-up to your research internship experience at Iowa State University. We are very interested in your thoughts about the program and the information you provide will be used to enhance the program.

Your participation in this survey is voluntary and we would greatly appreciate your taking about 10-15 minutes to answer the questions. When you have completed the survey, please return it in the envelope provided. To be sure that your answers remain anonymous, please do not put your name or return address on the return mailing.

The identification code on your survey will be used solely to facilitate data entry and to help with follow-up mailings to nonrespondents. The information you provide will not be shared with anyone except for Agriculture Minority Programs staff. The codes will be removed from the surveys when the study is completed. Please do not remove this identification code. If you have any questions or concerns about the survey, please feel free to contact Nicole Gale at 515-294-4519 or ngale@iastate.edu.

Enclosed is a $1 monetary incentive for your invaluable contribution to this survey. Your time and immediate attention is greatly appreciated and will contribute to the enhancement of the Agriculture Minority Summer Research Internship Program.

It will take 10-15 minutes to complete this survey. Please mail by October 22, 2001. Thank you in advance for completing the survey.

Sincerely,

Nicole Gale
Agriculture Education & Studies
Doctoral Candidate

Nina Grant
Director, Agriculture Minority Programs

B. Lynn Jones
Professor, Agriculture Education & Studies
SECTION 1. APPLYING TO THE PROGRAM
Please circle the appropriate answer(s) for each of the following questions, or fill in the requested information.

1. How did you learn about the Agriculture Minority Summer Research Internship Program at Iowa State University? (Please circle all that apply)
   a. School Teacher
   b. Guidance Counselor
   c. Family members
   d. Community
   e. Former Participants
   f. Don't remember
   g. Other (please specify) ________________________

2. Were you interested in applying because of the ... (Please circle all that apply)
   a. Research/educational experience
   b. Stipend/paycheck
   c. Trip away from home
   d. Interest in food/human nutrition
   e. Interest in animals
   f. Interest in horticulture
   g. Interest in environmental/natural resources
   h. Other (please specify) ________________________

3. How many times/summers did you participate?:
   1  2  3

4. Did you participate as a:
   a. high school student
   b. college student
   c. both

5a. What school(s) did you attend while you were participating in the program? Please provide the full name of the institution(s):
   __________________________
   __________________________
   __________________________

5b. And what was your classification when you were in the program (i.e. Freshman, Sophomore, Junior, Senior)
   __________________________
6a. How much understanding of agriculture would you say you had prior to attending?
   a. None
   b. A little
   c. Some
   d. A lot

6b. Where did you get this understanding? (Please circle all that apply)
   a. Studying in school
   b. 4H
   c. FFA
   d. Family members
   e. Personal/employment experience
   f. Other (please specify) __________________________

6c. Did participating in the internship broaden your understanding of agriculture?
   a. None
   b. A little
   c. Some
   d. A lot

SECTION 2. STUDENT EXPECTATIONS

Using a scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Agree and 4 = Strongly Agree, indicate your level of agreement with each of the following statements about your internship, social, and career expectations of the Agriculture Minority Summer Research Internship Program (AMSIP).

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

A. Internship Expectations:
   When I attended the AMSIP, I expected:
   1. to spend my work time at a farm
      1 2 3 4
   2. to spend my work time in a research laboratory
      1 2 3 4
   3. to spend my work time taking classes
      1 2 3 4
   4. to have regular one-on-one time with a faculty mentor
      1 2 3 4
   5. to spend my work time conducting library research
      1 2 3 4
SECTION 2. STUDENT EXPECTATIONS Cont.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

6. to conduct research outdoors
   1 2 3 4
7. to complete a research project
   1 2 3 4
8. to participate in every aspect of a research project
   1 2 3 4
9. to find significant results in my research project
   1 2 3 4
10. to work in a research group
    1 2 3 4

B. Social Expectations:
When I attended the AMSIP, I expected:
1. to spend my free time playing sports
   1 2 3 4
2. to spend my free time hanging out with friends
   1 2 3 4
3. to meet new friends
   1 2 3 4
4. to explore career options during my free time
   1 2 3 4
5. to learn more about Ames, Iowa, and ISU
   1 2 3 4
6. the program to have interesting and fun planned social activities
   1 2 3 4
7. to have many social interactions with Iowans
   1 2 3 4
8. a range of culturally diverse activities and services
   (e.g. churches, hair salons, movies, celebrations, etc.)
   1 2 3 4
C. Career Expectations:
When I attended the AMSIP, I expected:
1. to learn about various agriculture majors
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
2. to learn about various agriculture careers
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
3. to visit or tour various agriculture businesses
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
4. to learn about my specific agriculture interests
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
5. to interact with agriculture professional
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
6. to meet minorities working in or pursuing agriculture careers
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
7. to learn about agriculture employment opportunities
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)
8. to learn about agriculture education opportunities
   - Strongly Disagree (1)  Disagree (2)  Agree (3)  Strongly Agree (4)

D. Overall Expectations:
1. Did the program meet your internship expectations? (circle your response)
   a. Exceeded my expectations
   b. Met my expectations
   c. Did not meet my expectations
2. Did the program meet your social expectations? (circle your response):
   a. Exceeded my expectations
   b. Met my expectations
   c. Did not meet my expectations
3. Did the program meet your career expectations? (circle your response)
   a. Exceeded my expectations
   b. Met my expectations
   c. Did not meet my expectations
4. What did you enjoy most about the program?
5. What did you enjoy least about the program?
6. What were the three most useful things you learned during the program?
SECTION 3. MAJORING IN AGRICULTURE-RELATED SUBJECT AREAS

Please circle the appropriate answer(s) for each of the following questions, or fill in the requested information.

1a. I am currently a student in...
   High school    College    Neither

1b. If you are currently a student, what is your classification?
   (Freshman, Sophomore, Junior, Senior)

1c. If you are currently a student, what is your major?

2. List all the high schools and colleges/universities you have attended with dates and major: (i.e. American University 95-99 Horticulture Major/biology minor)

   School          Dates          Major

3. Did the research internship encourage you to consider majoring in an agriculture-related area?
   Yes    No

4. I was influenced to major in an agriculture-related area by... (Please circle all that apply)
   a. Vocational agriculture teacher
   b. 4-H/FFA organization
   c. Family members
   d. Advisor/guidance counselor
   e. Community
   f. Personal interest

5. I was discouraged from majoring in an agriculture-related area because...
   a. Subject areas uninteresting
   b. Lack of money in profession
   c. Lack of minority role models
   d. Lack of information concerning employment opportunities
   e. Stereotype of minorities in agriculture
SECTION 4. THE LEARNING EXPERIENCE

1. Using a scale where 1 = least important and 6 = most important, please rank each of the following components of the AMSIP according to how important they were to you. Use each number only once.

   a. Research experience
   b. Social activities (Mall of America)
   c. Cultural activities (Iowa History)
   d. Diversity make-up of interns
   e. Diversity make-up of university
   f. Gaining Independence

2. What kind of skills do you think you gained from your research internship experience?

3. The internship program provided knowledge about...(Please circle all that apply)
   a. Career opportunities in agriculture
   b. Job seeking skills
   c. General information about applying for higher education
   d. Hands-on learning experiences
   e. Writing research papers
   f. Preparing formal presentations
   g. Preparing academically for higher education
   h. Other (please specify)

4. During the internship, I learned the following things...(Please circle all that apply)
   a. Effective work habits
   b. Critical thinking skills
   c. Decision making skills
   d. Ability to communicate effectively (writing and speaking)
   e. Ability to work with others
   f. Self-confidence

5. Did you find the research subject area ... (Circle all that apply)
   a. Exciting
   b. Boring
   c. Difficult to understand
   d. Not challenging enough

6. Were your mentor(s)...(Circle all that apply)
   a. Helpful
   b. Resourceful
   c. Never around
SECTION 5. AGRICULTURE INVOLVEMENT
Please circle the appropriate answer(s) for each of the following questions, or fill in the requested information.

1a. As a result of your research internship experience, are you still involved with agriculture-related activities/information?       Yes  No

1b. If yes, in what capacity?
   a. School (high school or college/university)
   b. Community
   c. 4H/FFA
   d. Job
   e. Other

2. Are you currently employed in an agriculture-related position?       Yes  No

3. Did your internship experience encourage you to pursue a career in agriculture?       Yes  No

SECTION 6. RECRUITMENT/RETENTION
Please circle the appropriate answer(s) for each of the following questions, or fill in the requested information.

1. Do you think that your research internship program experience has made you more likely or less likely to attend Iowa State University? 
   __ More likely  __ Less Likely  __ Neither

If you said more likely, why? __________________________________________

If you said less likely, why? __________________________________________
2. Using a scale where 1 = least important and 6 = most important, please rank each of the following barriers that may have hindered your decision to attend Iowa State University.

a. Shortage of minorities in Ames
b. Climate
c. Demographics (location/expensive travel)
d. Cultural differences
e. Lack of personal accommodations
   (e.g. barber/beauty shops, minority radio stations)
f. Other (Please specify)

SECTION 7. GENERAL INFORMATION

About You: Please check the appropriate answer(s) for each of the following questions, or fill in the requested information.

1. Gender: ___ Female ___ Male

2. Age: _____ years

3. Ethnicity: (Check all that apply)
   ___ Black/African American  
   ___ Latino/Hispanic  
   ___ Asian American/Pacific Islander  
   ___ Native American/American Indian  
   ___ Other (please specify) ________________

4. Highest level of education completed:
   ___ High school  
   ___ Associate (two-year) degree  
   ___ Bachelors (four-year) degree  
   ___ Masters degree  
   ___ Doctorate degree  
   ___ Other (please specify) ________________
Thank you for your help.

Please return your completed questionnaire in the enclosed envelope to:
Nicole’ Gale
Agriculture Minority Programs
23 B Curtiss Hall
Iowa State University
Ames, Iowa 50011-1050

Code number________
APPENDIX C.

QUALITATIVE RESPONDENT COMMENTS
Qualitative Respondent Comments

- I think that this particular program should continue every summer. It gives students the ability to be more independent from their families. The students learn a lot from all the activities that are scheduled. It's a good advertisement for Iowa State's enrollment. It lets students know that it's more to Agriculture than just farms and animals.

- This is a very good program that I encourage anyone to take part in. The only comment that I have is that when choosing professors for mentors, that they are available for the summer. My personal experience was that for the most part, I created my own research project. This actually turned out to give me valuable experience for my graduate work but I thing the point was to learn from a mentor.

- After the program, I chose to stick with science. I plan to earn a PhD instead of going to law school. Nicole'. You did a great job with the program & I am glad that I had the opportunity to participate.

- The AMSIP experience can not be compared to any other experiences I've had. The AMSIP displayed a variety of options, which were displayed on the day of presentations. No. Thank you...Alahalo from Hawaii

- Overall I believe that this is a good recruiting program.

- I would love to attend ISU because I thought the lay-out of the campus was outstanding. They have everything you could ask for there. Also I had a lot of fun while an intern at ISU. Thank you for the genuine opportunity.

- This internship was a rewarding experience & has been used in a lot of my classroom discussions.

- I loved it there at Iowa. The staff of Nicole, Nina, and Debbie made my stay a wonderful memory that I will never forget. I loved making new friends and just the over all program. Thanks for everything and take care! Much Aloha & Mahalo.

- This program benefited me more in a personal way. Not only did I leave with a group of friends, I also left with a new found knowledge about Food Science & bit more self-confidence in a way. Before I participated in the internship, I wouldn’t have believed myself to be capable of doing all the things I did. It was definitely a growing experience for me.

- The AMSIP is a very interest program, it is help in other way as reference & job experience. Overall, I will recommend this program to stay forever & very grateful for the sponsors and everyone who supported it.
• I loved the program. It was a real eye opener. *Motivator.

• The ISU Ag Minority Internship was very positive experience for me. I not only grew in knowledge, I also made great lifelong friends. I still keep in contact with many people from the program and definitely look back on my summer with good memories. I feel that by participating in the ISU internship, I greatly improved my college application to the University of Chicago. I sent a copy of my final project as part of my portfolio and it was partly from this portfolio that I received a scholarship to attend college. I definitely have a better understanding of Agriculture and the careers and majors attributed to the subject. I really enjoyed my internship and would definitely recommend the experience to others.

• I would like to thank all the staff for giving me the opportunity to be a part of a very wonderful program that I believe was a very good experience for myself along with many others.

• The internship program was very helpful both academically and socially.

• I didn’t necessarily apply to the program for its emphasis on agriculture, but rather for the opportunities related to the field (yet not the field). I enjoyed my time at Iowa State, but in comparison to the other institutions I am able to attend, ISU would never really be one of my options. The program was effective in encouraging interest in agriculture but the emphasis wasn’t imposing with a marginal interest in pursuing a career in agriculture. I wasn’t affected too greatly by the push towards attending ISU or changing my mind towards a career in agriculture.

• I appreciated this college/research type experience. Learned a lot about the people & myself. Wish I could do it over again. Will cherish the memories. Also look forward to continued contact & networking. Please continue this program for other students.

• The internship was different but similar for me at the sametime. The research environment was just like another internship I participated in. The location and the diversity of people and cultures were different from what I am use to. This program was a great experience for me. Even though I’m not an agriculture major now, when I go to graduate school, I plan to get my PhD in Agriculture Business. This internship has led me to endless opportunities.

• I really enjoyed my experience at ISU. It made me realize what going to school out-of-state would be like, and helped decide to go to school in-state. Not only did the experience help me with my intrapersonal skills, but also in time management. I greatly value my experience at ISU.

• In order to make this internship worthwhile, high school students should not be accepted into the program. It is a waste of time and money. They have no idea and plans on where they want to go and what they want to do. Also, they have no experience in
certain agricultural areas. I suggest accepting more college freshman & sophomores in agricultural majors who know what the want to do & who have some experience that way the research department that will have those students will be able to benefit from these college students rather than high school students.

- The Ag. Minority Internship Program was a great and wonderful experience. I was exposed to many opportunities that will enable me to strive further and harder in life. The diversity not only involved culture but technological, philosophical and scientific beliefs.

- The program was a great experience.

- I'm glad I became apart of this internship. It prepared me before I started college here. I learned a lot and I'm glad this internship exist. It really helps to attract students.

- The internship was a great opportunity to see some of the stereotypes about minorities prove wrong.

- I really did enjoy my stay at Iowa State University and I am more than willing to tell some of the students in my school about the program. I am also thinking about going to graduate school in Iowa. If not ISU, then University of Iowa will do. It all depends on my graduate interest. Thanks for giving me the opportunity to participate in the program. I really did learn a lot and I am very grateful and appreciate having this experience. Thank you everyone.

- I actually enjoyed being in the program. It was my first time being out of town away from home for two months. I met some really nice people, inside and outside the program. If I had another chance in doing the program, I would do it again, but in a different field.

- I enjoyed all the school activities that were planned for this summer. This is the first program I have been a part of where there were different places to go outside the work environment. Don't change that.

- Thanks for the lunch money. I really enjoyed being in the program.

- I found the internship very informative and helpful. It is a summer that I will not forget.

- The experience was somewhat different than what I expected, but that just gave me more of an opportunity to learn.

- This is a very good program. It is a very well rounded program, in that it has a little bit of everything. The activities as well as the people involved in the program. It was quite a learning experience.
- Surveys given to students sooner. After 2 1/2 months of ending internship, hard to remember specifics.

- Great program. I loved my time there. I will be applying to grad school at Iowa. Without the program I would not have known about ISU.

- Most of my answers reflect the fact that I did not come to this research internship because of agriculture aspect. I came to conduct research. It was a well run and organized time for me. Although this program is focused towards Agriculture regardless I came to gain experience with research. Although the diversity in Iowa (Ames) is scarce the knowledge I gained here was worthwhile.

- This program generally was a great experience with the exception that my work atmosphere. I learned a lot and was given a lot of knowledge on things I never knew. I was grateful for the McNabb’s.

- Tuskegee mail is really slow sorry about missing deadline.
APPENDIX D.

ADDITIONAL TABLES
Respondents’ Schools Attended:

Alabama A&M University (3)
Auburn HS
Buffalo State College
California Polytechnic State University
CHSAS-Chicago High School for Agricultural Sciences (2)
Como Park HS
Crowpoint Institute of Technology
Eastern New Mexico University
Florida A&M University (FAMU)
Frankfort HS
Franklin HS (2)
Hancock Central HS
Hancock HS
Haskell Indian Nations University
Humbolt University
John Marshall HS
New Mexico State University
North HS
Oglala Lakota College
Pierce Joint Unified School District-HS
Proviso East HS
Rutgers State University
Seattle University
Sitting Bull College
SUNY College
Tuskegee University (4)
UMBC-University of Maryland Baltimore County
UMES-University of Maryland Eastern Shore (23)
University of Florida
University of Montevallo
University of Pennsylvania
University of Wisconsin-Milwaukee
Valparaiso University
Waiakea HS
Waimea HS
Wasilla HS
West Point HS
Western Hill HS
Wichita State University
William Hart HS

* Each school had at least one participant unless otherwise stated.
REFERENCES


Agriculture Diversity Programs (2001). Iowa State University: Ames, IA.

Agricultural Minority Programs (2001). Iowa State University: Ames, IA.


Enrollment Services (1999). Iowa State University Undergraduate recruitment.


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