New Mexico State University

ARROWHEAD CENTER

LEADING ECONOMIC DEVELOPMENT FOR NEW MEXICO STATE UNIVERSITY

Marketing Strategy Research

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Submitted
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Live, Learn and Thrive

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1.0 INTRODUCTION

This report documents the research that has been undertaken as background for preparation of a marketing campaign for middle and high school students to increase interest in national security careers at the National Nuclear Security Administration. This work is a part of the National Security Preparedness Project (NSPP), being performed under a Department of Energy (DOE)/National Nuclear Security Administration (NNSA) grant. This report is due on March 31, 2010, as performance measure 3.1.1 (Grant No: DE-FG52-07NA28084, "Proposal for FY 2009 Congressional Appropriation: Technical Proposal", September 1, 2009, Page 5).

Previous research on the development of a properly trained and skilled national security workforce has identified a lack of interest by k-12 students in the STEM (Science, Technology, Engineering, and Mathematics) fields. Further, participation in these careers by women and minority populations is limited and is not increasing. Added to this are low educational achievement levels in New Mexico, where the marketing campaign will be deployed.

2.0 BARRIERS IN STUDENT INTEREST

Student interest in a number of critically important fields and specialties such as physics, chemistry, and engineering has been in long-term decline. This can be attributed to several factors such as poor educational STEM (science, technology, engineering, and math) preparation in primary, middle, and high schools, as well as a suppression of inquiry and imagination in middle and high schools. Poor educator preparation in these fields can be manifested because of no real-world experience and a lack of accountability for instructors and institutions.

The lack of involvement by parents and communities also contributes to a lack of interest in these fields and a misunderstanding of current and future career paths. Therefore, students are not properly informed of the potential in these fields. The most notable factor is the lack of importance of science and technology in the national conscience, and the perception that true expertise in these fields is not currently valued in society.

Often secondary and post-secondary students do not realize the immense opportunities available in the science, technology, engineering, and math fields, and many do not enter these fields as a result. Students often lack mentors or role models in these fields. When added to the fact that students live in a society in which everything is available immediately, numerous years of educational preparation for employment in the national security fields is oftentimes not attractive. Further, the prohibitive cost of post-secondary education is a major determining factor.

In 2007, all U.S. educational institutions awarded two and a half times more engineering, math, and computer science degrees than 40 years ago. [22] Even with this increase in the number of graduates, there is still a shortage of potential employees at NNSA as fewer graduates actually accept employment in the public sector. For many, salaries and benefits are much more attractive in the private sector. Today's graduates do not feel the call to serve their county as previous generations did. Today's youth does not know a time when the U.S. was not the world's sole superpower. Further complicating the shortage of national security workers is the prohibition of hiring foreign nationals and the placement of this type of work off shore.

The necessity of a security clearance by employees is often a barrier to employment with NNSA, and potential employees and students often are not informed of this requirement. Students may pursue a

particular educational degree with an eye toward working for NNSA, only to find out after graduation they are not eligible for a security clearance, and thus not eligible for employment with NNSA. The generation currently in secondary and post-secondary education is experiencing a higher incidence of drug use, illegal or excessive alcohol use, or felony convictions that prohibit them from qualifying for a security clearance. Drug use can be overcome; however, the latter two are permanent conditions that result in a permanent inability to obtain a security clearance.

Many reasons exist why secondary and post-secondary students don't think of career opportunities in the national security fields. Especially with female and minority students, an image problem exists with the fields of engineering, technology, math, and science. Many students are just plain unaware of the wide variety of opportunities available. Extracurricular programs involving math, engineering, and the sciences are rare but important as they serve as recruitment tools for educators and provide opportunities to expose students to possible careers at the NNSA.

3.0 STATUS OF EDUCATION IN NEW MEXICO

While New Mexico has experienced an increase in educational achievement over the last several years, there are still a great number of students graduating without the necessary basic skills and graduation rates remain dismal. According to the New Mexico Higher Education Department, in any given year, only one in twelve freshmen high school students will go on to complete high school in four years and obtain a bachelor's degree within six years of high school graduation.[1] In New Mexico, the graduating class of 2008 had a dropout rate of 39.7% overall, ranking it one of the worst in the nation.[2] During this same time period, the Anglo student high school dropout rate was 28.7% compared to the dropout rate of 43.8% for Hispanics and 39.1% for African Americans, with females graduating at higher rates than males.[3] Even more alarming, this rate has remained relatively stable since the early 1990s.[4]

Despite these poor statistics, New Mexico experiences a high college going rate of 38.2% of high school graduates[5]. However, the college completion rate is only 11.9% of all high school graduates. Projects such as this marketing campaign are a good tool for encouraging students to graduate from college. It is well documented that students who know what they want to do when they enter college are much more likely to graduate from college than those who enter college and do not know what they want to do. According to the U.S. Census Bureau, 20.1% of the population of New Mexico over the age of 25 possesses a college degree[6]. It is important to increase the overall educational level of New Mexican's as there is a proportional increase in unemployment and lower educational levels.[7]

4.0 EMPLOYMENT NEEDS AT THE NATIONAL NUCLEAR SECURITY ADMINISTRATION

In 2007, with a workforce of 2,463 in multiple locations, the average age of the NNSA workforce was 49 years of age, with an average length of service of 17.5 years. Of the total workforce, 2.65 percent have

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[1] New Mexico Department of Higher Education, Retrieved February 25, 2010 at http://www.nmhed.state.nm.us

[2] **4 Year Cohort Graduation Rates, Class of 2008, New Mexico Public Education Department, Retrieved, February 2, 2010, at http://www.ped.state.nm.us/Graduation/dl10/graduationRates2008postAppeal.pdf**
[3] **4 Year Cohort Graduation Rates, Class of 2008, New Mexico Public Education Department, Retrieved February 2, 2010 at http://www.ped.state.nm.us/Graduation/dl10/graduationRates2008postAppeal.pdf**
[4] **Measuring Up 2008, The National Center for Public Policy and Higher Education, Retrieved February 2, 2010 at http://hed.state.nm.us/cms/kunde/rts/hedstatenmus/docs/797457018-12-03-2008-11-19-40.pdf**
[5] **Dasenbrock, R. (May 5, 2008). *It's not graduation rates that matter.* Retrieved December 20, 2009 at http://hed.state.nm.us/cms/kunde/rts/hedstatenmus/docs/411014279-05-08-2008-13-56-33.pdf**
[6] **U.S. Census Bureau, Retrieved February 27, 2010 at http://factfinder.census.gov/home/saff/main.html?_lang=en**
[7] **US Department of Labor, Bureau of Labor Statistics, Retrieved February 27, 2010 at http://www.bls.gov/opub/ted/2009/mar/wk5/art03.htm**

an associate's degree, 33.41 percent have a bachelor's degree, 27.4 percent have a master's degree, 3.09 percent have a doctoral degree, and 43.4 percent are at least 50 years of age. The current workforce is comprised of 30 percent minority populations. Since 1995, the NNSA has experienced a 27 percent reduction in its workforce. This decline in staffing has left NNSA with a significant challenge: reinvesting in its human capital to ensure that the right skills are available to successfully meet its missions.

The work of NNSA is broken down into function areas. The majority of the total NNSA personnel are located in the Safety and Health, Science and Engineering, Logistics, and Administration functions. It is important to note that every function within the NNSA, with the exception of logistics and foreign affairs and intelligence, has a workforce that is more than 40% over the age of 49. With the average retirement age for NNSA career employees at 59, the NNSA will experience a high rate of turnover for many years to come, and well into the next decade. The largest function is Science and Engineering. More than three fourths of the personnel in this function are at least 40 years of age. Impending retirements will hit this function hard and for an extended period of time.

Through fiscal year 2010, NNSA can expect to lose 106 senior supervisors, as well as a number of personnel with various certifications, to retirement. This large extent of turnover will have a huge effect on NNSA productivity. The majority of the senior supervisor personnel loss will be in the Quality Assurance and Science and Engineering functional areas, however, the losses are spread out across all functions. NNSA currently has personnel with various certifications spread across all NSA functions. As a result of previous turnover, there are now a number of personnel that lack various certifications. It is expected that number lacking certifications will increase over the next five years as a result of the expected retirements of personnel in the following areas:

- 31.7% of Federal Project Directors
- 41.7% of Contract Management
- 41.2% of Technical Qualifications Program

In 2006, NNSA indicated that about 40% of nuclear weapons program technical staff members were eligible for retirement. An independent estimate provided by the Department of Energy/National Science Foundation, Nuclear Science Advisory Committee (NSAC) report issued in 2004 suggests that within ten years"…more than three quarters of the workforce in nuclear engineering and at the national laboratories will reach retirement age." A true need exists to replenish this workforce.

With the average age of the NNSA workforce being at 49 and 33% of the workforce eligible for retirement in the next five years, it is not only important to assess the current workforce, but project future needs as well. The current workforce has extensive experience, expertise, and knowledge in fields that make their skill set nearly irreplaceable. That, coupled with fast changing technology developments, makes it difficult to train, recruit, and retain an adequately skilled national security workforce.

5.0 GOAL OF THE MARKETING PROJECT

The main goal of the marketing campaign for New Mexico middle and high school students is to present benefits, programs, and recruitment policies related to careers in nation security with NNSA. A further goal is to make these students aware of the wide variety of career opportunities that are available in national security and at NNSA. A final goal is to make students aware of the strict guidelines that are imposed for obtaining security clearances. Decisions they make in middle school, high school, and college could affect their ability to obtain a security clearance. Through a comprehensive marketing

plan that is repeated semi-annually for all students in grades 6 - 12, it is anticipated that secondary students will become familiar with career opportunities at NNSA. Further, it is anticipated that students involved in the marketing campaign will lay ground work in high school for these career opportunities and pursue post-secondary education to meet the job requirements.

6.0 FOCUS GROUPS

It was determined early in the research process that it would be necessary to conduct focus groups with middle and high school students. Items to be explored during the focus groups included interest in STEM subjects in school, knowledge of and desire to pursue careers in national security fields, and discovery of overall marketing approaches that would most appeal to students in these age groups.

During the focus groups, students were provided with pizza, brownies, and bottled water and asked to listen to a very short presentation on the NNSA and its job opportunities. Students were also engaged in providing feedback on interest in careers in the STEM fields and whether or not these were viable career options. Students were given information about the process of obtaining a security clearance and what items would exclude them from this classification. Lastly, students were asked to complete a short questionnaire that was designed to gauge overall interest in careers in national security and working at NNSA, overall interest in careers with STEM concept applications, future job wants and needs, and desire to pursue post-secondary education after graduation from high school. At the end of the focus group, students were given a one page handout about career opportunities in national security at NNSA to take home.

The middle school focus group was conducted at Camino Real Middle School in Las Cruces, New Mexico on March 5, 2010. Fourteen students participated, some of whom were very interested in math. Results of the completed survey provided useful information that will be utilized in the development of the marketing campaign. Figure 1 below depicts the survey results for interest of the students in STEM subjects, with students showing the most interest in technology and engineering.

Figure 1. Student Interest in STEM Subjects.

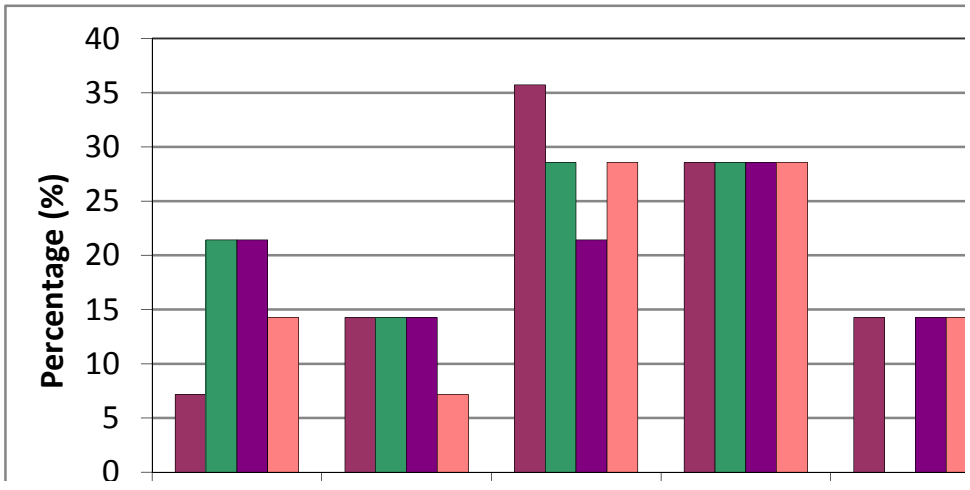
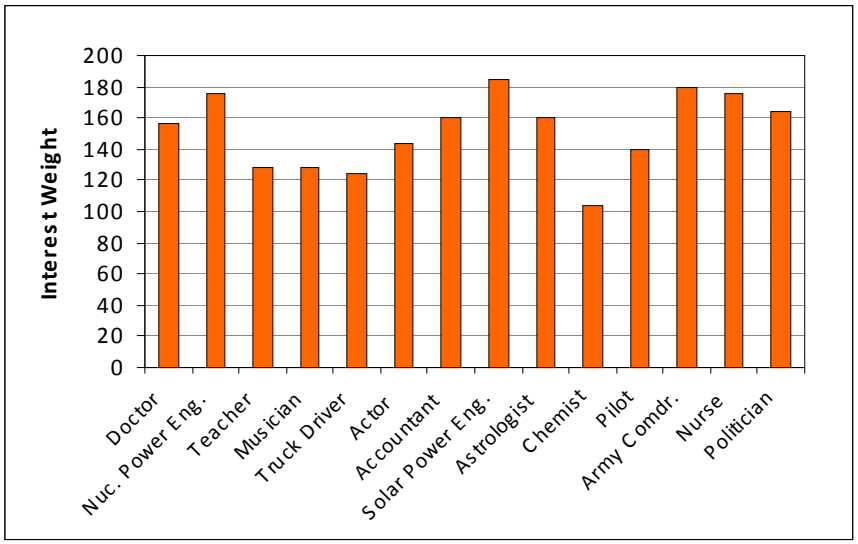


Figure 2 below indicates the survey resuts for a wide variety of career options for the students in the middle school focus group. The careers most highly rated were nuclear power engineer, solar power engineer, army commander, and nurse. Three of these careers would have employment opportunities at NNSA.

Figure 2. Student Career Interests



The middle school students participating in the focus groups overwhelmingly identified job satisfaction, salary, and job location as the most important needs for their future jobs. The majority of the students indicated they are planning to pursue post secondary education after graduation from high school, with the majority planning to obtain at least a master's degree.

Of great importance is the fact that only 20% of the students in the focus group knew about NNSA prior to the presentation. After hearing the presentation however, more than 80% of the students were interested in learning more about NNSA and exploring career opportunities in national security. There is a need to inform students about career opportunities in national security early and often. Even better news is that students are receptive to considering these careers when informed. The information received during the focus group and on the surveys is very helpful and be used to develop the marketing campaign aimed at New Mexico middle and high school students to increase awareness of and participation in careers in national security at NNSA.

Focus groups with high school students are scheduled for early April, 2010. Due to standardized testing schedules, activities, and spring break, these focus groups could be scheduled earlier. The focus group for high school students will be handled in the exact same manner as the middle school focus group to ensure consistency in feedback that is received.

7.0 CONCLUSION

The majority of the barriers to the development of an adequate and properly trained national security workforce rest with the educational system. These are not barriers that have developed in the short-term; these barriers have been in existence for many years. NNSA is in dire need of a wide range of employees and New Mexico is in dire need of a more highly education population. The research that has been gained in this step will be used to guide the development of a marketing campaign to increase interest among middle and high school students in careers in national security at NNSA and do away with some of the identified barriers. Much is to be gained by everyone when educators—in partnership with NNSA—work to inform students, especially female and under-represented students, of potential opportunities in STEM related national security careers.