An implementation study of the Science and Technology Entry Program (STEP) in New York State

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AN IMPLEMENTATION STUDY OF
THE SCIENCE AND TECHNOLOGY ENTRY PROGRAM (STEP)
IN NEW YORK STATE

by

Susan C. Perkins

A Dissertation Submitted to the University at Albany, State University of New York
In Partial Fulfillment of
The Requirements for the Degree of
Doctor of Philosophy

School of Education
Department of Educational Administration and Policy Studies
2013
An Implementation Study of the Science and Technology Entry Program (STEP)
in New York State

by Susan C. Perkins

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ABSTRACT

As global demands for workers in the science, technology, engineering and math (STEM) fields persist, there are increased opportunities for historically underrepresented African-American and Latino youth to fill STEM career pipelines. African-American and Latino youth have long faced disproportionately high unemployment rates. Joblessness has been complicated by lower high school graduation rates for African-American and Latino youth. Significant federal and state funding has been allocated to address this state of affairs. Research findings on STEM career development programs for historically underrepresented youth can inform public policy and resource allocation.

The career development provided by the Science and Technology Entry Program (STEP) of the New York State Education Department is nationally recognized. The program plays a major role in strengthening STEM career pipelines for youth who are historically underrepresented in post-secondary STEM courses of study. STEP is a recipient of a Presidential Award for Excellence for mentoring secondary students as they transition successfully into undergraduate and graduate academic programs that lead to STEM careers.

This comparative study of four STEP sites is a process evaluation. It examines STEP state policy as adopted and local STEP implementation processes. The study findings are derived from official documents and semi-structured interviews with key STEP personnel at the state and local levels. This timely study yields important findings about program design as well as the will and capacity of program implementers. It identifies ways to strengthen the capacity of STEM career development programs for economically disadvantaged youth.

The study suggests that K-16 partnerships should be characterized by implementation flexibility so that career development staff may connect and restructure program activities to best meet programming needs. This flexibility can lead to instructive solutions regarding increased parental involvement and male participation in career development programming. The findings also suggest that when partnering organizations work in close proximity with one another, transparent, professional relationships are cultivated. These partnering organizations should extend beyond K-16 organizations in order to broaden the constituency that has a stake in the success of programs that serve historically underrepresented ethnic minorities.
DEDICATION

This book is dedicated to those in my family who have persevered to fulfill their dreams to serve others in the science, technology, engineering and math (STEM) fields: Great-great grandfather “Doctor” Griffin, a physician who came from England in the late 1800s to care for the people of the tiny island of Barbuda; Joan J. Mapp who immigrated to Canada and eventually the United States from Barbuda without a high school diploma and earned her Bachelor’s in Registered Nursing from Misericordia University in 2010; Janet Perkins who started as a loan operations clerk and worked her way with integrity through the ranks to become the first African-American Chief Technology Officer of a Manhattan-based credit union; and Kevin Walkes, a civil engineer who set time aside to work with youth who have the same career aspirations.
ACKNOWLEDGEMENTS

“. . . in the multitude of counselors there is safety.” Proverbs 11:14, NKJV

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Thank you to Shayla Armand of the Rensselaer Polytechnic Institute for critiquing a “vey rough” draft of my dissertation proposal. Thank you to Michael Fancher of the College of Nanoscale and Engineering, Joseph Bowman (in memoriam) and Etwin Bowman of the University at Albany, and Carlos Garcia of the New York State Education Department for helping me to focus on what would be my final topic.

Thank you to the New York State Department of Labor (NYSDOL) staff who supported me while I completed this study: Karen Coleman who continued to set time aside from her role running the Workforce Development Department to mentor me. Even as her responsibilities intensified as Deputy Commissioner, whenever I asked, she
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Thank you to Denise Landy, a veteran NYSDOL administrator who made it her personal mission to ask me if I was meeting my dissertation research goals and provide “pep talks” when I needed them. Thank you for being part of a network of people who gave me pushes that I needed along the way to finish. NYSDOL colleagues like Marsha Mortimore, Kristina Krise, Vincent Brewer, Bridget Kennedy and Juie Deo who would check in with me periodically with words of encouragement were “bright lights.”

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Thank you to the dedicated STEP professionals (including former staff persons) who shared their perspectives on the program’s design and implementation. They gave their time in the midst of very busy schedules to answer my interview questions, often checking with me to make sure that the information they provided was relevant.
This work was copyedited by Harolyn Hood, a former medical writer with an artisan’s eye for fluid writing. Thank you to Averell Hilton, owner of ACS Printing in Albany, NY for referring me to Harolyn and printing copies of my dissertation.

Lastly, a hearty thank you to my husband, Jerome Perkins; mom, Celeste Cole; aunt, Bernadette Cole Slaughter and other family members and friends – like David and Sandia Bullow, Elisa Martin and Michelle Trotman – whose support was invaluable throughout my studies.
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CHAPTER 1: INTRODUCTION

In the United States millions of students, particularly African-American and Latino youths, are not completing high school (Martin and Halperin 2006). These ethnic minority groups have average graduation rates about equal to or less than 50% (Callan et al. 2006; Martin and Halperin 2006; Lawson 2008). For more than a decade, significant state and federal investments have been made to raise high school graduation rates. They include monies designated for career development programs established to ensure that this country increases its talent capacity, particularly in the science, technology, engineering and math (STEM) fields (Center for Benefit-Cost-Studies of Education 2006; United States Department of Labor [USDOL] 2007; Alliance for Science and Technology Research in America 2010; Brody n.d.). This dissertation describes a comparative case study of four Science and Technology Entry Program (STEP) sites in New York State that provide STEM career development support for middle and high school students. The study is a process evaluation of the implementation of STEP policies at the four sites (Vergari 2005).

Research indicates that high school graduation rates will increase when schools make greater connections between what students learn in class and who they will become as adults. One way schools can clarify these connections for students is to provide them with career development experiences during their middle and high school years (Noeth et al. 2003; National Research Council Institute of Medicine 2004; Wimberly 2004; Wimberly and Noeth 2005; American College Testing [ACT] 2007b;). Exposure to high quality career development experiences can enable students to competitively vie for future employment opportunities in STEM fields.
The Demand for STEM Positions

Occupations associated with STEM fields range from those that require at least a four-year college degree to those that expect workers to have completed high school with a career and technical education (formerly known as vocational) certification (USDOL 2007). In fact, there are a large number of jobs that require no more than a two-year degree and compensate workers well for mastery of their particular trade (New York State Department of Labor [NYSDOL] 2011a). For example, favorable job growth rates are expected for avionic technicians (11%), civil engineering technicians (17%), agricultural and food science technicians (9%), and industrial engineering technicians (7%) through 2018 (USDOL 2010).1 These positions have starting salaries that range from about $24,000 to $40,000 (NYSDOL 2011b, 2011c). Entry-level positions in these fields generally do not require a four-year college degree.

Global markets and the need for more STEM workers. In June 2011, industry giants like the Boeing Company and the United States’ Office of Naval Research announced plans to provide more opportunities for employment in STEM fields (Office of Naval Research Corporate Communications 2011; Zacks Investment Research, 2011). The Boeing Company is one of the largest aerospace and defense contractors in the world, managing a backlog of more than 2,100 Boeing 737s. It has plans to increase monthly production of its Next Generation 737s and Boeing 777s by 33% and 66%, respectively. The Office of Naval Research, hereafter referred to as the Navy, announced that it has long-term plans to double its STEM career investment of $54 million in 2010 to $100 million in 2015. The Navy’s efforts are due largely to an aging workforce that includes more than half of its STEM professionals being eligible for retirement by 2020.

1 USDOL growth rates are cited as percentages in parentheses.
Shirley Ann Jackson is the first African-American woman at Massachusetts Institute of Technology to get a Ph.D. in theoretical physics (Rawe 2005). Jackson is now President of Rensselaer Polytechnic Institute and a staunch advocate for STEM career development of youth in the wake of current workforce demands (Rensselaer Polytechnic Institute 2010). Rensselaer Polytechnic Institute is the nation’s oldest technological university and is renowned for its school for engineering, ranking 37 out of 198 on the *U.S. News and World Report* (2010) for “Best Engineering Schools.”

Jackson presented a speech in 2007 at the National Science Foundation entitled, “‘The Quiet Crisis’: Developing the Next Generation of Leaders for a Complex World” (Jackson 2007). She highlighted the need for young women and historically underrepresented ethnic youth to prepare themselves to fill STEM positions that will be vacated by aging and retired scientists: “Young women and ethnic minority youth now account for more than half of our student population. This ‘new majority’ traditionally has been underrepresented in science and engineering, has few role models, and yet it is from this group that the next generations of scientists and engineers also must come” (Jackson 2007, 2).

*Significance of the shortage of ethnic minorities in STEM fields.* In the United States, post-secondary graduates with computer-based degrees are in high demand (Meszaros and Kahle 2007; Symonds et al. 2011). Efforts to increase American STEM professionals has become of particular concern since the September 11th, 2001 tragedy, which was followed by changes in immigration policy (USDOL 2007). For the 2001-2002 academic year, the Integrated Post-secondary Education Data System (IPEDS) identified STEM post-secondary degree completions as areas of national need (Goan et
Accompanying the urgency for more post-secondary, computer-based degrees seems to be a high interest in earning these degrees during the past decade. More people are enrolling in STEM post-secondary programs and studying fields that have been identified as having shortages of graduates native to the United States.

The IPEDS data (Goan et al. 2006) indicate that although graduates with STEM degrees were in national demand, computer and information science careers were among the four highest national need areas in which the most degrees were awarded at an associate’s and bachelor’s levels during 2001-2002. This was also true during that same year for engineering and related technology degrees awarded at the master’s and doctoral degree levels.

Data from the Computing Research Association (CRA) Taulbee Survey of Ph.D.-granting computer science (CS) and computer engineering (CE) recipients in the United States and Canada (Vesgo 2008) complement the IPEDS data. Only 1% of CS and CE degrees were awarded to African-American, non-Hispanic graduates in the 2006-2007 academic year. Hispanics also earned 1% of these degrees and Native Americans 0%. White, non-Hispanic graduates received 27% of the degrees and nonresident alien graduates received 56% of the degrees. From the 1999-2007 academic years, nonresident alien groups have received an average of 49.63% of CS and CE Ph.D. degrees. White, non-Hispanic graduates represented an average of 33.75% of the total recipients of these degrees. African-American, Native-American, and Hispanic graduates received an average of 1.25%, 0.25%, and 1.38% of CS and CE degrees during these academic years.

(See Table 1.)
The actual numbers of degrees conferred from 1970 through 2001 also highlight persistent underrepresentation; 8,913 CS and CE doctorates were awarded to Whites, and 154 were awarded to African-Americans. From 1984 (when the Taulbee Survey began tracking data for Hispanic graduates) through 2001, 6,737 CS and CE doctorates were awarded to Whites while 232 were awarded to Hispanics (Vesgo 2008). See Appendix F for 2001-2011 data regarding persistent underrepresentation of ethnic minorities.

Table 1. Ethnicity of U.S. & Canadian CS & CE Ph.D. Recipients (Vesgo 2008)

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Nonresident Alien</th>
<th>African-American, Non-Hispanic</th>
<th>Native-American</th>
<th>Hispanic</th>
<th>White, Non-Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>47%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
<td>39%</td>
</tr>
<tr>
<td>2000-01</td>
<td>46%</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
<td>38%</td>
</tr>
<tr>
<td>2001-02</td>
<td>47%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>37%</td>
</tr>
<tr>
<td>2002-03</td>
<td>43%</td>
<td>1%</td>
<td>0%</td>
<td>2%</td>
<td>37%</td>
</tr>
<tr>
<td>2003-04</td>
<td>48%</td>
<td>2%</td>
<td>0%</td>
<td>1%</td>
<td>35%</td>
</tr>
<tr>
<td>2004-05</td>
<td>53%</td>
<td>1%</td>
<td>0%</td>
<td>2%</td>
<td>31%</td>
</tr>
<tr>
<td>2005-06</td>
<td>57%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>26%</td>
</tr>
<tr>
<td>2006-07</td>
<td>56%</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
<td>27%</td>
</tr>
<tr>
<td>Average percentage of Ph.D. degrees conferred from the 1999-2000 to 2006-2007 academic years</td>
<td>49.625%</td>
<td>1.25%</td>
<td>0.25%</td>
<td>1.375%</td>
<td>33.75%</td>
</tr>
</tbody>
</table>

*Efforts to prepare students to meet demands for STEM positions.* In a 2011 report released by the Harvard Graduate School of Education, “Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century,” the authors describe quality programming as having several key attributes (Symonds et al. 2011). Effective career development programs are designed to equip students with critical thinking abilities, mastery of subject matter content, and “soft skills in terms of working
with people in a real-life context” (Symonds et al. 2011, 18). The report also indicates the need to provide more support for ethnic minorities who are experiencing historical trends in income gaps.

**Ethnic minorities and teen unemployment rates.** Chart 1 shows that African-American and Latino youth have been disproportionately represented in unemployment rates from 1994 – 2010 (Economic Policy Institute 2011). For more than a decade, these ethnic groups have experienced unemployment rates above 10 percentage points higher than their White counterparts. With the growing global demand for STEM professionals, there are unprecedented opportunities for underrepresented ethnic minorities to fill these positions. Several initiatives have been created to improve the numbers of American students entering STEM fields (Symonds et al. 2011; American Psychological Association n.d.). These initiatives provide career development support for African-American and Latino students, inclusive of those that are from economically disadvantaged backgrounds.

**Career Development Programs for Economically Disadvantaged Youth**

Upward Bound Math and Science (UBMS), Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), Talent Search, and the intended focus of this study (STEP) are examples of programs implemented for economically disadvantaged youth in the United States.

In fiscal year 2010, these programs collectively anticipated providing more than $509.4 million in federal and state funding to promote career development for youth from
families with low income levels.\textsuperscript{2} Table 2 in Appendix A outlines details regarding eligibility requirements and funding for these programs.

**Chart 1. Races Hurt by Recession, Racial, and Ethnic Disparities Persist**

*(Economic Policy Institute 2011)*\textsuperscript{3}

![Chart 1: Races Hurt by Recession, Racial, and Ethnic Disparities Persist](chart1.png)

*Note:* Shaded areas denote recession.

Of the four career development programs identified, STEP is the oldest and the only initiative funded by the New York State Department of Education (NYSED). STEP receives a minimum of 25\% in matching funds from other sources such as private and other governmental contributors (NYSED 2010b). In contrast, UBMS, GEAR UP, and Talent Search operate under the auspices of the United States Department of Education (USDOE) and are not required to secure matching funds. These career development programs are considered extra-curricular and, therefore, are not a part of the core programs.

\textsuperscript{2} The term "low income individual" means any person whose family's taxable income for the preceding year did not exceed 150\% of the poverty level amount. The U.S. Department of Health and Human Services determines poverty levels; family income levels are determined by the U.S. Census Bureau. For example, as of January 20, 2011, a family of three who earned no more than $27,795 in the 48 contiguous states and DC would qualify as meeting low income levels.

\textsuperscript{3} Chart 1 was reprinted with permission from the EPI Director of Publications.
curriculum for middle and high school students. As a result, when federal and state budgets are diminishing, funding for these programs can also diminish.

In 2003 STEP and its sister organization, the Collegiate Science Technology and Entry Program, received an award for excellence in STEM mentoring from President George W. Bush (National Science Foundation 2004). The STEP initiative was awarded because of the program’s reputation as an exemplar for mentoring secondary students as they transition into academic programs where they can obtain undergraduate and graduate degrees that will lead to successful career opportunities. There are a total of 60 STEP sites across New York State, including all five boroughs of New York City (NYSED 2010c). The mission of STEP is to increase the numbers of students interested in STEM-related careers, particularly those who are African-American and Hispanic/Latino (NYSED 2010c, 2010d). At its student conference in 2011, STEP celebrated 25 years of service. In anticipation of the annual STEP conference, students in grades 7-12 submit poster abstracts for review by a panel of judges. These posters display students’ research in the biological sciences, human services, physical sciences, social sciences, or technology.

Other organizations that were recognized by President George W. Bush in 2003 for excellence in mentoring secondary students to enter STEM careers include (1) the American Physiological Society (APS), (2) the Center for the Advancement of Hispanics in Science and Engineering Education, and (3) the National Society of Black Engineers (NSBE).

The American Physiological Society (APS), founded in 1887 with 28 members, currently offers free K-12 online outreach resources for middle and high school teachers
The Frontiers in Physiology Professional Development Fellowship for Teachers Program (Frontiers’ Fellowship Program) is an example of an APS fellowship opportunity targeted to secondary teachers of underrepresented minorities. The Frontiers’ Fellowship Program, which marked its twentieth anniversary in 2010, spans a year and includes a summer of intensive workshops with mentor teachers and physiologists. The National Institute of Diabetes and Digestive and Kidney Disease will provide $350,000 in funding for the Frontiers’ Fellowship Program for fiscal years 2010 – 2012.


Under Vela’s leadership, CAHSEE became a Latino Science Engineering Consortium member along with the Society of Hispanic Professional Engineers, the Society of Mexican American Engineers and Scientists, and the Society for the Advancement of Chicanos and Native Americans in Science (CAHSEE 2003a). One of CAHSEE’s main initiatives is to offer four consecutive summers of science and engineering career development to fifth through eleventh graders at select colleges of their choice. These colleges include George Washington University, the University of
Illinois at Chicago, the City University of New York, and Merrimack College. Verizon Communications, the Inter-American Development Bank, the Fannie Mae Foundation, the Meyer Foundation, and the Sun Microsystems Foundation have all provided funding for CAHSEE (CAHSEE 2003c, 2003d; CAHSEE 2004).

Like STEP, APS and CAHSEE, the National Society of Black Engineers (NSBE) was created to support underrepresented students interested in STEM careers. NSBE is a student run organization with a mission to “increase the number of culturally responsible Black engineers who excel academically, succeed professionally, and positively impact the community” (NSBE 2010a, 1). NSBE was founded in 1975 by six students: Anthony Harris, Brian Harris, Stanley L. Kirtley, John W. Logan, Jr., Edward A. Coleman, and George A. Smith (2010c). By March 2011, NSBE had grown to more than 31,000 members pre-college and college members across the United States. NSBE provides 18 regional conferences, an annual convention, and scholarships to students in high school and college (NSBE 2010a).

In 2010, NSBE partnered with businesses like Delta Airlines, General Electric, General Mills, IBM, Procter and Gamble, and Wal-Mart to award $504,500 to 176 national scholarship recipients. Approximately 13% or $63,500 of the scholarship monies was awarded to high school students (NSBE 2010b). The research herein focuses on career development programming that targets youth before they graduate from high school.
Research Questions

The following research questions guided the proposed investigation of how policies intended to maintain and improve the quality of New York State’s STEP initiative are implemented.

1. What is the New York State STEP initiative as designed?
   a. How long has the program been in existence and what are the program objectives?
   b. What policy assumptions does the STEP initiative reflect?
2. To what extent does implementation of the STEP initiative by New York State Education Department administrators align with the program as designed?
   a. If there are differences between the program as designed and the program as implemented by New York State Education Department administrators, what are the reasons for these differences?
   b. What types of challenges confront STEP administrators at the state level?
3. To what extent does implementation of the STEP initiative by four STEP sites align with the program as designed?
   a. If there are differences between the program as designed and the program as implemented by the four STEP sites, what are the reasons for these differences?
   b. What types of challenges confront STEP administrators at the four STEP sites?
4. What are the overall strengths and weaknesses of the STEP initiative in terms of the fundamental program design?
5. What are the overall strengths and weaknesses of the STEP initiative in terms of how the program has been implemented?
6. What are the implications of the research findings for future research and policymaking regarding career development programs focused on recruiting and preparing youth for STEM occupations?
Summary

Programs that prepare students of all backgrounds for science, technology, engineering, and math (STEM) employment opportunities are essential (USDOL 2007). This chapter highlighted STEM career development programs that have been recognized by the Office of the President of the United States for excellence, in particular the Science, Technology, and Entry Program (STEP). In fiscal year 2010, $9.7 million was awarded to a total of 50 STEP initiatives. Collectively, STEP’s purpose is to serve youth who are historically underrepresented in STEM careers or from economically disadvantaged households (NYSED 2010b).

Having access to quality career development programs is particularly critical for economically disadvantaged students, including those who are historically underrepresented ethnic minorities (PCAST et al. 2010; Symonds et al. 2011). Youth without sufficient economic, social, academic and other career support often rely on programs like STEP to pursue their educational goals. There is a great demand to know how nationally recognized STEM career development programs like STEP are implemented. As the need to fill STEM positions persists, studies like the one outlined in this dissertation become more significant in the effort to strengthen STEM career pipelines for historically underrepresented students (Maton et al. 2000; Treisman and Surles 2001; Margolis and Fisher 2002; ACT 2006; Burger et al. 2007; Meszaros et al. 2007; National Center for Women and Information Technology 2007; Jackson et al. 2009; Stone 2009).
CHAPTER 2: LITERATURE REVIEW

There are four areas of research that guided the proposed investigation of how career development policies for youth programs are implemented: (1) career, (2) self-concept, (3) social capital, and (4) policy implementation studies. (See Figure 2.1.) The research literature on career development clarifies the importance of distinguishing between the acts of obtaining a job and seeking a vocation (Creamer et al. 2007; Parsons 1909). Research on self-concept describes factors that impact the complex process of identifying the type of vocation one should choose (Mead 1934; Bandura 1982; Markus and Nurius 1986; Lee and Oyserman 2008). Social capital studies highlight the significance of social connections in the career development process (Coleman and Hoffer 1987; Coleman 1988; Lareau 2003). Lastly, the policy implementation research addresses issues that impact stakeholder involvement, funding, and program design (Vergari 2005; Hill 2006; Fowler 2009).

Figure 2.1. Four Areas of Research that Guide Study
CAREER STUDIES

As the global community develops new technologies to meet changes in the marketplace, both current and aspiring workers must be positioned to play a role in addressing needs dictated by these changes (Arthur and Rousseau 1996; Brown and Lent 2005). In the contemporary workforce, those who have mastered skill sets are challenged to adapt and often abandon traditional ways of completing their work assignments (Arthur and Rousseau 1996; Brown and Lent 2005). Due to challenges in the economy, most employers can no longer ensure an organizational career or job security within a single setting (Arthur and Rousseau 1996).

Today, graduates must be prepared to address the complexities of the cultural work environment. They must understand the values and beliefs that guide the work environment and know how best to thrive given such realities (Sergiovanni et al. 1999). The most successful students seem to be trained as anthropologists – observing the career environment to glean differences between what is reportedly most valued by colleagues, supervisors, and clients versus the hidden or underlying beliefs that permeate the work culture (Khleif 1969; Kuh and Whit 1997; Neuman 2006). Schools supply the fertile ground in which socialization and communication skills may be acquired and germinated.

Brown and Lent (2005) argue that there is a need for more research regarding the socialization support students receive during school-to-work transitions. Students perceive that the cultural expectations of post-secondary schooling and the work environment may be different, which may cause feelings of anxiety that can lead to the use of maladaptive strategies such as passive avoidance and behaviors associated with learned helplessness (Brown and Lent 2005).
Elementary, middle, and high schools are made up of cultural systems or social collectives with their own mores, expectations, and unspoken rules of conduct (Singleton 1987). It is often true that youth with an equivalent or even greater academic ability than others are not able to successfully complete what is required of them. This may be due to an inability to cope with the challenges of meeting expectations that arise within the school culture (Battisch et al. 2000; Blank and Berg 2006; Kim and Taylor 2008; Christman et al. 2009). Attention to social as well as academic needs when preparing youth to transition into the world of work is essential.

Once graduates have transitioned into their new careers, they will be challenged to use social competencies learned in the school setting as they prove their ability to contribute to the competitive marketplace. Hall (2002) proposes that the contemporary workforce, due to its propensity to change, requires that new recruits master career metacompétencies. These competencies enable them to learn new adaptive skills so that they are less likely to utilize maladaptive ones. These adaptive skill sets include being able to acknowledge and understand that work environments employ psychological contracts that prescribe long and short-term commitments. Due to the demands of a fluid, 21st century workplace, the successful graduate must have a clear sense of personal identity and adaptability as these contracts become amended or discarded. New recruits cannot expect stability as the status quo.
Factors that Shape Youth Career Development

Effective career development programs are structured to help youth thrive in complex environments while helping them identify their long-term career goals. Frank Parsons’ work in the beginning of the 20th century is credited with being the first to develop and advance this perspective, asserting that career goals should be the foundation of a carefully considered career plan (Association for Career and Technical Education et al. 2008). Establishing career plans will potentially have a profound impact on the youth and the society in which he or she lives. These short and long-term plans should be based on the youth’s intended vocation as opposed to placing the youth in a position because the opportunity arises. Implementation of individualized career plans will increase the likelihood of youth achieving success (Parsons 1909). A substantive plan is the result of career counseling that takes into account a “clear understanding of [the] youth, [his or her] aptitudes, abilities, interests, ambitions, resources, limitations, and their causes . . .” (Parsons 1909, 5). Students benefit from being in programs that provide a number of options to explore “when, where, how and what to study” (Wagner 1999, 61).

Bailyn (1989) described a career as framed by what people are directly and concretely involved in—what they do, how they are treated, and how they react to these experiences. People may have a number of jobs during their lifetime. Effective career development programming for youth provides students with a substantive understanding of “the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work” (Parsons 1909, 5).

Influence of socio-economic status and parents. Families with limited income can benefit greatly from having access to important information about career support.
Lawson (2008) drew attention to how students in families with limited economic resources drop out of school at much higher rates than their peers with greater monetary resources who attend the same schools. There are also differences between how male and female students perform. Lawson (2008) noted that on average, male students are more vulnerable than female students because they graduate at lower percentage points than females.

Creamer et al. (2007) provided well-defined terms and supportive examples as part of an exploration of parental impact on the career development of daughters. Using qualitative and quantitative methods, Creamer et al. (2007) analyzed data from 373 female respondents and comparison data from 404 participants. All participants were either academics who researched issues associated with gender and information technology (IT) (or computer-driven careers) or educators who design programs to recruit and retain women in IT field. It was discovered that women interested in the IT field perceive that their parents played a more significant role in their career choices than any other source.

**Identifying sources of career development information.** To further substantiate the connection between career development and social interactions, Creamer et al. (2007) detailed another study of how individuals make career decisions. The research design included utilizing a fictional model named Kiaya who was described as the “next generation IT worker” (Creamer et al. 2007, 17). Kiaya represented qualitative and quantitative findings from research conducted from 2002 to 2005. Participant counts (i.e., percentages of high school students who participated follow each count in parentheses) were 467 (37.9%), 124 (50.8%), and 556 (38.2%), respectively.
The longitudinal study found that for both genders, high school and college students often made career decisions based on limited amounts of concrete information from outside sources. Participants preferred to act based on the advice of trusted social contacts, like parents and friends. Women especially were more likely to make career choices that pleased their parents. It was also discovered that the fewer contacts with whom respondents discussed their career development choices, the greater the likelihood of them pursuing their goals. Additional research is needed on how self-reflection and contact with outside sources impacts one’s career decisions (Creamer et al. 2007).

*Early career development intervention.* Scholars have also studied student development of career aspirations from kindergarten. Regular school attendance from kindergarten through high school increases opportunities to receive requisite learning as well as guidance and career support. The more students attend school the greater the likelihood of educational staff identifying them as having STEM interests. Once a student’s interests are discovered, their skills can be consistently developed (Romero and Lee 2007; Bayer 2010; Hill et al. 2010).

Bruner et al. (2007) used 2000 census data to create a detailed overview of factors that rendered impoverished families more vulnerable to a lack of school readiness than others with more financial stability. Ten measures of social, educational, economic, and wealth indicators were examined. Social indicators included percentages of single parenting and youth ages 16 to 19 year old who were disconnected, defined as not being enrolled in school or employed. The educational, economic, and wealth indicators provided information about adults’ school completion and the ability to financially sustain their households. Bruner et al. (2007) found that 6.7%, or 18.9 million persons in
the United States, scored high on at least six of the 10 indicators. The adults in this 6.7% cohort, most earning low wages, generally had the largest number of children. Approximately 50.2% of their children were infants up to four years of age.

To further highlight the burdens disadvantaged families bear, Bruner et al. (2007) discussed geographic characteristics that impact children. Impoverished families are often in racially and socially segregated neighborhoods. This isolation leads to “vulnerable child-raising” environments or neighborhoods that place impoverished families at risk for impeded growth (Bruner et al. 2007, 10). School absenteeism is often the result, leading to underperformance that could impact their career development in various ways. Bruner et al. (2007) concluded that early interventions are vital for pre-school aged children.

Other scholars have identified needs to provide early support to vulnerable children in order to examine the impact that middle school (fifth through eighth grade) experiences have on the academic success of students from impoverished neighborhoods. Balfantz (2009) researched several cohorts of students from the Philadelphia Education Fund. These students were in middle school yet past their “on-time” graduation to high school. Despite the academic challenges that youths in communities with less economic and social resources faced, they demonstrated resiliency. Balfantz (2009) observed that sixth graders who were identified by school staff as being in danger of failing to meet graduation requirements remained in school typically for five more years. This allowed more substantial time for the underperforming sixth graders to receive vital learning, guidance, and career support.
Findings from the Bayer Facts of Science Education XIV survey (2010) also encourage K-12 educators to address issues of student underperformance, career development, and motivation. It is important to address underrepresentation of women and minorities in STEM fields in the United States and to promote their progress in an environment of global competition (Bayer 2010).

The Bayer survey was conducted to identify root causes of underrepresentation in STEM fields, and was based on the opinions of 1,226 respondents (Bayer 2010). Female chemists and chemical engineers of African-American, Latino, and Native American descent were polled. The survey was conducted with the understanding that the opinions expressed by participants do not necessarily represent a “monolithic group, but individual groups whose members may share common experiences” (Bayer 2010, 7).

Across gender and ethnic-racial background, respondents indicated that interest in science began in early childhood (Bayer 2010) and nearly 60% identified such interest by age 11. More than 75% of respondents reported that minorities are underrepresented among STEM professionals because of a lack of encouragement and nurturing of these career interests early in life. The Bayer study concluded that science teachers can play a larger role in the stimulation and development of career interests than parents do.

**Influence of ethnicity and gender.** Howe et al. (2007) conducted research on gender differences in how students develop and sustain interest in pursuing computer science careers. Their research highlighted that STEM career aspirations may develop differently between genders. The study examined the behavior of boys who were eight years old and concluded that boys spend twice as much time playing computer games than girls do. They also found that boys practice IT skills outside of school more than
girls do, sharing information that their teachers may not have. From this early age, more boys created friendships and formed communities based on these “computer experiences.” These communal ties benefited the males greatly when they entered high school. As these eight-year-old boys continued developing their expertise and sharing information among themselves, they were often more knowledgeable about computers and computing by the time they took secondary courses than their teachers.

Meszaros and Kahle (2007) discussed research-based best practices that impact the career development of girls. For example, a longitudinal study of 45 girls (beginning by their eighth grade year and ending in their junior or senior year) from the Girls on Track (GOT) program revealed that girls’ interests in IT can best be developed by inspiring curiosity about how computer can be used beyond communication purposes. Girls need to be shown how creative computers can be and how IT career pathways lead to helping others solve problems (Meszaros and Kahle 2007). It is also essential to note that many IT career opportunities allow for having a flexible schedule so that women can meet the demands of maintaining a home and meeting work expectations. If parents, teachers, and school counselors are provided with more of this type of information about the creativity and flexibility of IT careers, girls will be more interested in pursuing jobs in the field (Meszaros and Kahle 2007).

Ethnic minorities and women often benefit from support that helps them overcome barriers associated with a work environment that is characterized by a dominance of cultures that are different than their own (Benokraitis and Feagin 2000). An individual’s ethnic identity can also impact his or her perception of any career barriers. Carlo (2000) found that perceptions of racial discrimination were significantly
related to individuals’ ethnic identities. Minority individuals with stronger convictions and positive feelings about their ethnicity and group membership perceived greater discrimination than those who shared less strong convictions. Carlo’s (2000) research suggests that minorities with stronger ethnic identities may benefit from career-counseling support that addresses these concerns and identifies ways to develop one’s career in spite of such perception.

**Support for transitions.** As students complete each stage of their academic career, they must deal with transitions associated with such change. Arthur and Rousseau (1996) defined transitioning as involving a continuous process of identifying obsolete career plans. These models are modified or abandoned by graduates in order to acquire more appropriate career models – ones that will sustain what Arthur and Rousseau coined as boundaryless careers or careers that drastically change from one day to the next.

Turner and Lapan (2005) called for more research regarding the socialization support students receive during secondary school to post-secondary life transitions. With such support students are able to adapt well to change. Students without this support often experience anxiety when they perceive that the cultural expectations of post-secondary schooling may be different. Such anxiety may lead to the use of maladaptive strategies such as passive avoidance and behaviors associated with learned helplessness (Turner and Lapan 2005).

Venezia (1999) and Elmore (2000) argued that school systems should strive to become one unified system instead of several entities in order to improve students’ transition from one level of schooling to another. This approach can particularly benefit students who underperform based on achievement gap data. With seamless, continuous
school systems, staff and others who support students as they mature can better deal with barriers to learning. Information-sharing or the flow of communication occurs more readily in school systems where different levels do not work in isolation (Venezia 1999; Elmore 2000). STEM career development programs that apply these communication principles can increase opportunities for students to realize their career goals. Developing students’ positive self-concepts is a foundational practice of this type of programming.

**SELF-CONCEPT STUDIES**

Whether youth are able to benefit from career development programs depends on how they view their past experiences, present actions, and future aspirations. Having an understanding of self-concept theories, like possible selves theory, helps to clarify the importance of student perceptions during various stages of their career development (Markus and Nurius 1986; Lee and Oyserman 2008). There are multiple factors that can influence students’ varied career paths. It is challenging to find causal relationships when a number of variables are involved. Lee and Oyserman (2008) addressed the challenge of identifying causal dynamics when conducting their research on the application of possible selves theory by using closed and open measures. Closed measures included giving study participants pre-set checklists of possible selves from which to choose. Open measures were added with the use of survey questions that generated individual responses. This encouraged collection of data that more readily reflected study participants’ perceptions.
**Development of Self-images**

Students’ self-perceptions included positive and negative images of themselves that could have been shaped by more than one experience. Whether youth have self-concepts that will compel pursuit of career interests despite what students perceive as the norm in their communities can also play a role in achieving their goals. Expressed career interests can be encouraged or dissuaded by contextual factors such as having developmentally relevant self-tasks. Such tasks include encouraging skill development (academic, social and/or behavioral) in ways that are likely to affirm the self-esteem of students. If tasks are not developmentally appropriate, students are less likely to experience school success. This can lead a student to confirm distorted information about what he or she can or cannot aspire to professionally (Lee and Oyserman 2008).

Students without sound self-perceptions may never consider participating in career development programming that no one else, or very few people, in the students’ community experienced. If individuals have healthy self-concepts, this will better enable them to take advantage of career development opportunities that promote success. This often involves taking action to initiate and sustain behavioral changes. With well-developed self-concepts, students benefit from being more able to step beyond what they are familiar with and ally with social groups that foster transformation into successful career selves. Students who can clearly identify their career goals and have a supporting self-concept are also more apt to experience success in school (Lee and Oyserman 2008).

Lee and Oyserman (2008) identified multiple factors that influence how students are socially conditioned to perceive themselves. These factors can impact whether distorted or more “factual” information is recalled. Examples included students’ ability
to articulate their career development goals and whether they have distorted self-perceptions as factors that may require more career development support (Lee and Oyserman 2008).

Lee and Oyserman (2008) based their research on the connections Hazel and Markus (1986) made between possible selves and personal functioning, which emphasized the effect of “failed” selves on future behavior. Individuals often create very vivid, “well-elaborated” pictures of failed selves. When individuals negatively perceive their past or present selves, they are more likely to envision bleak future selves. Seeing others attain success can counter pessimism about the future. “Many possible selves are the direct result of previous social comparisons in which the individual’s own thoughts, feelings, characteristics, and behaviors have been contrasted to [significant] others. What others are now I could become” (Hazel and Markus 1986, 11).

**Perceptions and Observable Behavior**

Self-knowledge concepts created by Hazel and Markus (1986) can be attributed in part to the pioneering work of Mead (1934), as well as Bandura (1982) and Dowrick (1977), who asserted the prominent role of perceptions in individual development. Mead (1934, 1) posited that “minds and selves are essentially social products. . .or phenomena of the social side of human experience.” Social products or phenomena cannot be measured solely by examining an individual’s actions. There are actions that an individual takes that are only observable to that person. There should be no “qualitative difference in the two cases” (Mead 1934, 2). Mead (1934) contrasted his work with behaviorist Watson (1913) who posited that Mead’s studies of social phenomena, like thoughts or introspection, were futile. He further suggested that identifying an
individual’s actions should only be the result of objective or observable study (Watson 1913).

Bandura (1982) asserted the importance of the relationship between an individual’s belief about self-performance and observable behavior. What an individual believes about his or her ability to accomplish a goal has more of an impact on future outcomes than external factors like demands made by others. Bandura (1982) cited an unpublished study conducted by Dowrick (1977) to illustrate how beliefs about one’s performance can affect success. Dowrick (1977) studied children with severe social and psychomotor disabilities. The children were videotaped as they completed tasks far above their skill level. Later, these children were shown the video of themselves accomplishing the high-level tasks. The video of the children accomplishing the advanced tasks was edited so that all of the children’s performance errors and utilization of aids were not shown. After seeing the video of their successful performance, the students performed at levels above baseline expectations on “other filmed but not observed activities (Hazel and Markus 1986, 8).” In the description of Dowrick’s research (1977), Hazel and Markus (1986) did not provide much detail regarding the children studied other than the nature of their disabilities.

If one was inclined to do so, it would be challenging to replicate the study without knowing more about the participants and the video intervention. For example, there is little information about the ages, gender and socio-economic backgrounds of the children studied. The types of baseline and advanced tasks the children completed were also not described. There were also scant details shared about the length of time the children were

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engaged in completing the tasks. It was also not clear if the videographer took footage over the course of several minutes or longer. Despite the lack of details regarding Dowrick’s (1977) study participants and the video intervention, it is intriguing to consider the possible impact of showing successful selves to children with identified deficits.

**The use of video to promote future selves.** Dowrick et al. (2001) later published a three-year, federally funded study on the impact of showing economically disadvantaged youth positive models of their potential future selves. Much more detail regarding the research process was included. Participants were involved in the design, administration, and interpretation of the interventions. One phase of the study focused on empowering the staff, parents, and children of three economically disadvantaged urban elementary schools in Philadelphia. All three schools had 50% or more of the student body qualify for free or reduced lunch. Across schools there were minimal budgetary and personnel resources. In one school 40% of students were identified as having English as their second language (Dowrick et al. 2001).

School assets included veteran staff “who were acutely aware of local needs through observations, staff and parent meetings and through attempting to meet [district] standards” (Dowrick et al. 2001, 77). The schools also had active parental participation. There was a core of approximately 10 parents in each school who actively served on school administrative committees. Students from the schools with identified reading deficiencies were shown two-minute videos to boost reading scores. The videos were made by allowing students to practice challenging words until they mastered the ability to read them. Students were not pictured making errors in the video; only student successes
were included in the intervention. The videos of the students’ future capacity for reading fluency success were shown before each subsequent tutoring session, encouraging them to focus on assets rather than deficits. This perspective frames the following section’s discussion on social capital.

**SOCIAL CAPITAL STUDIES**

The diversity of school communities can also impact the availability of social capital resources. Social capital resources are assets that develop primarily from interacting with people. Examples of social capital include the sense of security and access to information that results from being associated with a social group (Coleman 1988). These social relations are influenced by how people perceive each other and the communities in which they live. Social capital theories provide an essential perspective about how students gain support in their perspective communities (at home, within schools and other organizations) to achieve their career goals. They are useful “tools” to explore social connections that lead to career success. The research of Coleman (1988), Coleman and Hoffer (1987), and Lareau (2003) elaborated on the kinds of social capital students may draw from as they develop career aspirations and educational plans.

**Values and Career Development**

Social capital theories are also used to analyze factors that influence the value people place on social interactions. The work of Coleman (1988) and Coleman and Hoffer (1987) identified social dynamics that undergird how perceptions can shape information-sharing as individuals work to reach their goals.
Within communities there are supportive normative structures or standards that undergird group rules. Normative structures are important sources of social capital that impact whether individuals attribute value to certain types of social interactions versus others. Coleman (1988) illustrated these points with an example of a mother in Jerusalem whose goal was to raise her children in a safe environment. She viewed Jerusalem as a safe place to parent. She based this view on the expectation that adults there consistently adhere to norms that ensure appropriate care of unattended children.

Like the mother in Jerusalem, whose goal was to safely raise her children, people feel more supported in achieving their career goals based on their perceptions of operating norms. Adversely, if people perceive that social groups engage in activities that are contrary to norms conducive with reaching their goals, they may forego opportunities to share and receive information. Coleman’s (1988) work helps to uncover the underlying, and often complex, dynamics associated with these choices.

**Social interactions, relations, and expectations.** What often makes interactions within social groups complex is what Coleman (1988, S108-S109) described as “multiplex relations.” People often interact and share resources with one another in more than one social context. Coleman (1988) cited the example of two sets of parents who are members of the same church. After recognizing each other at the school where all of their children attend, they could share useful information about how best to navigate the school’s environment. Associations within two social contexts can serve to benefit both families if the information shared is perceived as useful.

Closure also explains how the dynamics of social groups can encourage achievement of one’s goals. Closure refers to the ability of persons to limit negative
actions and encourage positive ones based on social relationships. Coleman (1988) found that the more closure there is within a social group, the greater the support for social norms. This increased support exists among people who regularly interact, have high expectations of one another, and develop norms that are followed. Closure is also significant because it is based on understood expectations and engenders trustworthiness. Trust is built and maintained when groups are socially structured so that failure to meet an understood expectation has consequences. Failure elicits sanctions from group members who have unmet expectations of the person who did not meet those expectations.

Portes (1998), building on the work of Coleman (1988), also discussed social capital theory and its application to the quality of resources for those who are members of social groups. Portes (1998, 6) critiqued Coleman’s theories on social capital as lacking sufficient attention to the motivation of those who are social capital “donors.” He also highlighted the importance of distinguishing between those who have social capital, those who receive social capital, and the social capital resources themselves. For example, someone may be prompted by a family member to make a social capital connection. The person making the new connection may not be interested in the social capital resources that may result from the interaction. The prompted person may seek only to fulfill a social obligation on behalf of a family member. Fulfilling the social obligation has its own set of social capital benefits that are distinct from the social capital resources that the “new connection” could offer. Portes (1998) emphasized the significance of looking at these dynamics.
Parental involvement as a social capital resource. Parents can be influential in promoting disadvantaged youth as they seek career support within the educational and other types of community institutions in which they are involved. A parent can encourage or discourage student attendance in school. Coleman (1988) identified the background of the family as having a significant impact on the student dropout rate. He separated family background into three components: financial, human, and social capital. Some students may have access to more of one type of capital than another. It is important to make this distinction to avoid generalizations about youth and understand student differences.

The strength of relations between youth and their parents can dictate the amount of social capital that children receive (Coleman 1988). The physical presence of adults in the family and the concerted attention given to youth secures parent-child relations. When adults behave in ways that confirm that their children’s needs are important – like spending time with them – their children benefit. Adversely, consistent adult absenteeism leads to structural deficiencies in how children relate to parents. Adults may be absent due to single parenting or work conditions that cause parents to be missing from the home. Having access to grandparents or other relatives within or near the home can compensate for this structural deficiency (Coleman 1988).
Social Resources and Socio-economic Status

Lareau (2003) examined how social structures impact the ability of families to achieve academic and social success without adequate resources. She studied 12 families (six White, five African-American, and one interracial) from 1994 to 1995 who differed across socio-economic class. All of the families had children who were 9 or 10 years old at the time of the study.

Lareau (2003) discovered that those who are impoverished are often devoid of the social resources they need to succeed. Economically disadvantaged families receive resources within a bureaucratic structure that often provides slow and stigmatized service. She cited examples of poor families going through slow processes to receive food stamps and cash stipends as public assistance recipients. In contrast, middle class families did not have to deal with these types of pressures. Families with more economic means were more pressured by maintaining a busy calendar of school and social activities. Such activities contribute to the development of social capital and formation of career goals.

Lareau (2003) also found that middle-class parents tended to make more of a concerted effort in shaping their children's academic and social lives – another source of social capital. This was not an indication of middle-class parents caring more about their children’s future. It was more the product of the limited time working-class and economically deprived parents had to attend to academic and social issues. It was also an indication of the limited financial resources working-class and poorer families had at their disposal to support their children’s participation in these activities. As a result of these factors, she observed that the children of working-class and poorer families were allowed to have more leisure time and choice of play. Lareau also noted that middle-
class parents were more worried about whether their children would be excluded from activities that would interfere with their success. This prompted such parents to be more directly involved in shaping their children’s leisure time.

Lareau (2003) provided illustrative details throughout her research regarding the observations she made. She described how there was more verbal interaction in the homes of the middle-class families than in those of working-class and poorer families. This led to development of greater social capital – vocabularies and familiarity with social skills that would give middle-class youth more of an advantage in interacting with authoritarian figures outside of the home.

Lareau (2003) also described seemingly inconsequential differences in routines or traditions across socio-economic classes in ways that demonstrated the transfer of significant social capital potential. For example, she noted middle-class children learning how to give a firm, confident handshake. Other examples that fostered students’ abilities to be successful professionals included the social skills middle-class children master during soccer games or at piano recitals. These insights are noteworthy because developing interpersonal skills can lead to greater effectiveness in school and the workplace (Reece and Brandt 2008).

**Relating and Connecting with Others**

Lareau (2003) underscored the perspective that the manner by which working-class and impoverished neighborhoods are socially structured often contributes to the socialization skills youth are encouraged to master. Like Lareau, Rosenbaum (2001) also examined formal structures that can impact youth career development. Three questions guided Rosenbaum on articulating how individuals relate to others in structured settings:
(1) What types of interactions occur? (2) How are linkages or connections developed? and (3) If information is shared, how does this occur?

In addressing these questions, Rosenbaum (2001) described challenges that arise when youth interact with others and receive information. These challenges surface because of perceived capacity deficits of high school graduates – perceptions about youth skill deficits that are markedly different in other countries like Japan and Germany. “Japanese and German employers even see advantages to hiring younger workers who, besides being less expensive, are often more energetic and more easily taught, especially in new technologies” (Rosenbaum 2001, 3). Japanese and German youth are engaged in work considered too advanced for the same age groups in the United States. Are American youth inherently deficient? Rosenbaum definitively argued that this is not the case.

Youth unemployment (that persists across strong and struggling labor markets in which youth are disproportionately unemployed) is less likely a consequence of the skill sets youth have or do not have (Rosenbaum 2001). Rosenbaum posited that persistent youth unemployment is more likely a result of barriers students encounter when obtaining information within and across institutions. Fortifying these barriers are multiple layers of institutions that cultivate “structural barriers and unequal resources” that can make career development programming difficult (Rosenbaum 2001, 4). Instead of focusing on institutional problems that obstruct effective career development programming, particularly for youth with academic deficits, Rosenbaum offered a more solution-oriented approach based on the linkage model.
Information-sharing. Rosenbaum’s (2001) linkage model suggests that institutional contact between youth, school staff, and employers influence resources as well as incentives. These institutional influences result in “inequalities [that] arise, not merely from initial differences among individuals, but from the incentives, or lack of incentives, that society and schools offer to individuals” (Rosenbaum 2001, 4). Institutions promote “stratified incentives” or “strong linkages and incentives” to students who perform well academically and “weak linkages and few incentives” to students who have academic difficulties (Rosenbaum 2001, 4). Rosenbaum expanded the stratified incentives phenomenon by describing differences between the career development process for career versus work-bound students. Students with career plans that do not include college attendance, often receive scant information about the requirements involved and the actions they should take.

By employing Rosenbaum’s (2001) institutional model, economically disadvantaged (as opposed to solely academically disadvantaged) youth with strong academic backgrounds should readily obtain the career development information they need. If this is not the case, examining how career development policies are implemented is particularly important.

POLICY IMPLEMENTATION STUDIES

The original design of a policy is not necessarily reflected in the implementation of that policy (Vergari 2005). To understand how this may occur, it is important to examine program-planning assumptions and whether program goals are met. This section explores policy implementation factors related to the (1) motivation of program
staff who are accountable for implementing career development programs, and (2) the structure of educational systems that impede and support the efforts of program administrators to make changes that reflect new policies.

**Motivation to Implement Policies**

Professional autonomy is valued by “insiders” in public education such as instructional and administrative staff. At the same time, external stakeholders such as lawmakers and taxpayers expect these institutions to be held accountable to the public. Cultural and sociological perspectives can be applied to an analysis of this issue and the tension created by it, so career development administrators can more effectively motivate staff to implement necessary career development policies.

**Cultural perspectives.** Schein (1993) described the influence external stakeholders have on administrators and faculty by analyzing cultural elements within an organization. Through such an analysis of an organization’s culture, the complex manner in which stakeholders communicate and make decisions can be better understood. Careful analysis of an organization’s culture is key (Schein 1993; Lane and Brown II 2004).

Schein (1993) illustrated the impact of culture on decision making by providing an example of how not to analyze whether an organization’s staff is reaching consensus about how to operate. Errors in judgment were made when observing a staff meeting in which internal stakeholders were discussing an issue. What Schein initially thought he observed was an unproductive process whereby staff members were rudely interrupting each other and not attending well to the agenda items. After more substantive study, Schein observed that this method of vetting ideas served this culture well; it was
productive for the organization. This particular staff valued having contentious debates with only the best ideas “surviving” the discussion. Based on Schein’s (1993) perspective, what motivates both internal and external stakeholders to implement policies, how they achieve consensus about policy implementation, and what may be appropriate lines of communication for one organizational culture may not be the same for another.

Studying how the location of different parts of an organization can play a role is also critical. Policy implementation may differ within the same organization based on where component sites are located. For example, a site located in New York City may be bound by different governance procedures than one located in a smaller city (Lane and Brown II 2004).

**Challenges of Implementing Policies within Bureaucratic Structures**

There is consensus in the literature that the organizational culture of bureaucracies, like public schools, may not be conducive to the implementation of innovative policies. Elmore (2000) described public school systems as traditionally being ill-equipped to respond to increasing reform demands they face. School systems try to “bend the logic of the policy to the logic of how the existing institutions function, making the policy unrecognizable upon its arrival in the classroom” (Elmore 2000, 4).

Sociologist Merton (1957) also described interests of internal and external stakeholders within bureaucracies that can impact policy implementation. For example, Merton asserted that the “esprit de corps” or team spirit of internal stakeholders plays a significant role. External stakeholders are interested in receiving individualized services
and they want personalized attention to their needs, which may call for the rules to be applied to their situation in a utilitarian fashion as opposed to a rigid one (Merton 1957).

Merton (1957) illustrated these dynamics by describing exchanges between staff of the Greenwich Employment Exchange (GEE). The internal stakeholders, or GEE staff, band together as a group to maintain the status quo. If an external stakeholder, or taxpayer, comes to GEE seeking assistance and such assistance is contrary to maintaining the status quo, the internal stakeholders will work together to uphold the bureaucratic rules rather than meet the individualized interests of the external stakeholders. Team spirit becomes a tool that thwarts meeting the individualized interests of the taxpayer or person seeking services. Without people to serve, the GEE staff would not have employment. However, the GEE staff exert their professional autonomy in a manner that thwarts their being held accountable to those that they serve (Merton 1957). External stakeholders who provide financial incentives to an organization should not expect increased control or influence as a definitive outcome (Levy 1979).

**Communication of the vision to promote policy implementation.** Fowler (2009) discussed the impact of corporations, wealthy foundations, and the government on the policy-making process. Each type of organization may have a different understanding of the vision guiding policy implementation. Corporations and wealthy foundations may have less of a bureaucratic structure than educational and governmental systems, making it easier to adjust how policies are implemented within their organizations. This is not usually the case for public school systems and government entities like the Department of Education (Fowler 2009).
Language use can also complicate understandings of how to implement policies within and across organizations. Each type of organization typically adopts its own set of terms and associated meanings (Lane and Brown II 2004). When two or more types of organizations partner to implement a policy without establishing a common language, policy implementation can become complicated (Hill 2006).

Finding ways to clearly communicate policies and their importance to the staff who will implement them is essential. Leadership rests on the substance of values and ideas associated with policies (Sergiovanni 1992). These values and ideas can be effectively inculcated within an educational system by instituting comprehensive learning supports (Lawson 2007). Successful educational leaders consistently communicate their core values and ideals through interactions with the staff, students, families, and community served. For example, middle and high school principals can encourage partnering with extracurricular STEM career development programs as a vital part of delivering comprehensive learning.

As an integral part of the comprehensive learning supports paradigm, educational leaders implement initiatives that maximize opportunities for resource allocation, generating “resources, supports, and services not possible when schools and districts operate alone” (Lawson 2007, 10). An educational leader or designee with strong facilitation skills can ensure that public engagement activities revolve around “civil exchange of ideas among participants without grandstanding or polemics” (Henderson et al. 2007, 4). Working with community or service provider stakeholders who have authority and the capacity to partner is also key.
Expecting educational staff and service providers to operate in new ways depends on the ability to create opportunities for them to learn how to function well in newly designed roles (Lawson 2007). A distributed leadership model supports such reform. The capacity of those in positions of authority is developed so that others may be trained by them to perform in ways that will lead to sustaining public school systems characterized by comprehensive learning supports (Elmore 2000). When permanent mechanisms are in place, stakeholders are more likely to support efforts to implement STEM career development policies as designed (Lawson 2007).

The design of comprehensive learning support systems also addresses and prevents “non-academic barriers to learning, especially for students manifesting needs for health and social services” (Lawson 2007, 9). Educational leaders who implement such a design are able to maximize “opportunities for students’ learning and healthy development during out-of-school time” (Lawson 2007, 9).

**Anticipating barriers to policy implementation.** Anderson-Butcher et al. (2004) also addressed how to overcome barriers often encountered in policy implementation. Effective program administrators appreciate that they cannot foresee all barriers to realizing intended programming results. However, program administrators can manage their time so that plans for youth will be guided by reflection and input from as many strategic partners as time allows. Effective policy implementation is more likely to occur when leaders provide clear and consistent communication of the strategies and activities that are part of the overall vision for school success (Anderson-Butcher et al. 2004).

Such efforts encourage more reflective, responsive, comprehensive and culturally competent programming (Anderson-Butcher et al. 2004). Cultural competence is defined
as programs that are “tailored to the cultural norms and values of the participants and staff make every effort to include targeted persons in planning, implementation, and evaluation” (Anderson-Butcher et al. 2004, 4.4). Culturally competent programs also attend to the values of the sponsoring organization and the local neighborhood community. Such an accomplishment requires stakeholders to be engaged in all stages of programming – planning, implementation, and evaluation (Anderson-Butcher et al. 2004).

To meet as many needs of stakeholders as possible, Lawson (2007) recommended that a thorough inventory be conducted of the school system that has twin foci. The first part of the inventory focuses on identifying the needs, assets, and priorities of children and their families. Assessing the assets, gaps and opportunities of the school and community is the second focus. Identifying ways to reduce such fragmentation will most likely lead to innovative ways to include parents that have not participated in this type of program planning, policy implementation, and evaluation process in the past. Conducting a thorough inventory provides program administrators with the opportunity to collaborate with families and community stakeholders to implement policies that best meet the needs of the students and staff served (Lawson 2007).

**Summary**

Evaluating how STEM career development programs and policies are implemented can be a complex undertaking. The research literature on career development, self-concept, social capital, and policy implementation offer insights on how policies and programs can be altered during implementation. The literature review began with an overview of the work of career theorists such as Parsons (1909) and
Creamer et al. (2007) who identified components of effective career development programming. Principles espoused by career theorists can be applied to STEM career development programming for disadvantaged youth. Career theorists suggest that school leaders and others assist youth in drafting career plans centered around their talents. In addition, career plans that (1) include early career development support, (2) cater to families with limited incomes, and (3) meet the needs of participants across ethnicity and gender can greatly fortify the career pipelines of economically disadvantaged youth.

The research on self-concept examines youth’s beliefs about past, present and future experiences in relation to their potential for achieving their career goals. These beliefs were described as being influenced by multiple factors, including self-perceptions or images youths have about their ability to achieve success. Self-concept theorists like Markus and Nurius (1986) and Lee and Oyserman (2008) posited that youth have beliefs about their capability that affects achievement of their career goals. These principles have implications for how to serve disadvantaged youth in STEM career development programs who may be struggling to experience success. Implications include establishing protocols within career development programs that assess perceptions students have of their ability to obtain programming goals.

Social capital theorists analyze how values, social interactions, relations, and expectations cultivate student capacity to reach goals. Youth may place different values on social resources offered by adults in school and the workplace. This contrasting value system often leads to youth – disadvantaged youth in particular – receiving disincentives for achieving success. These disincentives can negatively impact students’ career development. When students have few incentives for actively participating in career
development programs, the importance of their exchanges with their parents increases. Parent-child interactions can vastly impact how students are able to value school experiences. Valuing school experiences is particularly important as youth seek information within and across institutions that can assist them with their STEM career development.

Policy implementation theories were applied to the educational environment in which STEM career development programs are likely to operate. Across schools and career development programs, policies as designed can become modified when implemented. This can be due to stakeholders’ motivation (or lack thereof) to implement the policies. Depending on the culture of an organization, stakeholders may choose to interpret and implement policies in ways that significantly contrast with other organizations.

The research on policy implementation also examines how communicating the vision that guides a policy can increase staff compliance with implementation plans. Reflective policy implementation includes stakeholder input and clear and consistent communication. It can also be characterized by support for the policy as designed across school systems and the community. School leaders and others who practice reflective policy implementation can avoid misunderstandings in communicating the intent of the policy and therefore its execution.
CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

Science, technology, engineering, and math (STEM) career development programs can be designed with the best of intentions. Trained program staff are assigned to ensure that each youth served has an individualized STEM career plan. These plans include STEM career development programs that develop the self-concepts of the youth and help them make important social connections to foster their career goals (Parsons 1909; Markus and Nurius 1986; Coleman and Hoffer 1987; Coleman 1988; Lee and Oyserman 2008).

Despite these factors, program implementation may differ from the original program design in significant ways (Fowler 2009; Hill 2006; Vergari 2005). Chapter 2 provided examples of how contextual or environmental conditions could impact policy implementation at the STEP sites. Such conditions include program design assumptions that may or may not be reflected in the policy implementation process (Vergari 2005). A careful case study approach to research can reveal complex dynamics that emerge during the implementation process. Completing open-ended interviews to collect detailed information and perspectives from those who are implementing the STEP initiative was an integral part of the research design (Creswell 2009). Using semi-structured interview questions, rather than a more rigid approach, encouraged participants to share their experiences and perspectives (Knight 2002; Social Development Department 2011).

Focusing the multiple-case study on the STEP initiative within New York State (hereafter referred to as the State) was key to this research for two primary reasons. The first is due to the State’s highly professionalized governmental system (Merton 1957;
Benjamin and Benjamin 2006). The State’s bureaucratic structure is arguably well suited to implement policies as designed. Bureaucratic governmental structures by definition employ a top-down method of communicating and implementing policies. These factors may encourage uniformity and increase the likelihood of STEM career development programs being implemented as designed.

The second reason why the State was well suited for a study of STEM career development programming for youth is due to the growth of its STEM industry. The State has a developing history of cultivating the economic capital and human capacity necessary to support high-technology sectors (Geiger and Sa´ 2008; Metrics for Success Task Force 2009). Governor George E. Pataki’s administration (1998-2007) contributed significantly to this trend. The Pataki administration supported the creation of the New York State Foundation for Science, Technology, and Innovation which was formerly known as the Office of Science, Technology, and Academic Research (NYSTAR). The goals of these technology-based economic development efforts were also adopted by Governor Eliot Spitzer’s administration (2007-2008) and it maintained the use of the NYSTAR acronym (Geiger and Sa´ 2008). NYSTAR continued to be featured on Governor Andrew Cuomo’s website through the beginning of his governorship (New York State Government 2011).

The STEM career development of youth is a core element of maintaining a pipeline of future workers to support technology-based economic development in the State (Metrics for Success Task Force 2009; Alliance for Science and Technology Research in America 2010). This dissertation research examined whether sustained
interest in technology-based economic development in the State is accompanied by robust implementation of STEM career development programming at four STEP sites.

**Research Design**

This study examined how program planning assumptions impacted the implementation of the STEP initiative for disadvantaged youth across four STEP sites during the 2011-2012 program year. A focus on STEP was timely due to its objective to prepare disadvantaged youth for STEM careers. Although other research methods could have been employed, the case study method was especially useful for understanding “a real-life phenomenon in depth,” including significant contextual conditions that influence the phenomenon (Yin 2009, 18).

**Case Selection**

The research design used a purposive sample rather than a random sample during the case studies in program year 2011-2012. A random sampling of STEP sites would not have suited the intended purposes of this research. Using a purposive sample allowed for a more targeted examination of differences in the STEP sites’ policy implementation practices. Random sampling might have resulted in studying STEP sites that were very similar in their policy implementation practices, limiting the ability to draw comparisons across STEP sites.

A list of 15 of the 60 potential STEP sites for the study was developed. (See Appendix C for a list of proposed STEP sites for the study.) The proposed list of STEP sites was developed with an effort to include post-secondary institutions that had courses of study with a STEM focus. Examples of potential STEP sites included Columbia University’s College of Physicians and Surgeons, and CUNY John Jay College of
Criminal Justice; a private and public university, respectively, both located in New York City. The private Rensselaer Polytechnic Institute and public University of Rochester’s School of Medicine and Dentistry were listed as potential upstate post-secondary institutions that have STEP initiatives.

Knowing each STEP had been implemented for at least ten years was a consideration for study inclusion. A focus on examining short-term implementation can magnify occurrences of failures. Studying implementation of programs that have existed for a decade can yield more reliable and valid findings (Kirst and Jung 1980). Thus, only STEP sites that had been operating for 10 years or more were considered for the study.

Participants in the research were sought until consent was secured from four sites. The final list of four study sites was chosen based on whether the post-secondary institution was public or private and located in downstate or upstate New York. (Refer to Table 3.1.) Public and private post-secondary institutions can differ in the constituency served and their governance – including how fiscal resources are accessed and dispersed (White 2003; American Association of Dental Schools 2008).

Whether an organization was located inside or outside of New York City was also an important consideration. Governance structures that impact policy implementation can differ depending on whether an organization is located in an upstate region of New York that is less populated or a city downstate that can draw a larger student population (Lane and Brown II 2004). Differences between governance structures in New York City and the rest of the state can also impact policy decisions (Callan and Bowen 1997).
### Table 3.1. Criteria for Selection of Participating STEP Sites

<table>
<thead>
<tr>
<th>STEP Sites</th>
<th>Private/Public Post-secondary Institution</th>
<th>Location of STEP</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>Private</td>
<td>Downstate New York</td>
</tr>
<tr>
<td>II</td>
<td>Private</td>
<td>Upstate New York</td>
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<tr>
<td>III</td>
<td>Public</td>
<td>Downstate New York</td>
</tr>
<tr>
<td>IV</td>
<td>Public</td>
<td>Upstate New York</td>
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### Data Collection

Study findings were derived from two types of data: documents and 21 face to face, semi-structured interviews (Knight 2002; Social Development Department 2011). First, the types of documents collected and analyzed included (1) the STEP 2011-2015 request for proposals, (2) grant applications submitted in response to the STEP 2011-2015 request for proposals, (3) mission statements, (4) planning documents such as minutes from committee meetings and progress reports, (5) newspaper accounts, and (6) self-studies for accreditation and other available reports. Analysis of documentation also included examining electronic information such as websites maintained by NYSED and the participating STEP sites.

Second, study findings were derived from in-depth, semi-structured interviews with NYSED officials and program administrators at the four STEP sites. Semi-structured interviews, guided by previously drafted questions, encouraged a conversational exchange of information (Knight 2002; Social Development Department 2011).

Three NYSED administrators who provided program oversight for the STEP sites were interviewed. At least four members of the STEP site administration team at each of the four study sites were also interviewed. The STEP site administration team members
included directors, assistant directors, and staff members who served in any program administration capacity at the STEP site.

The length of each interview averaged 60 minutes. Upon securing permission from the interviewees, all 21 interviews were recorded and transcribed. If an interviewee was not able to meet face to face, a telephone interview was arranged. In some cases, e-mail correspondence assisted in data collection, especially when addressing follow-up questions that arose during data analysis.

**Interview Protocols and Data Analysis**

Separate interview protocols were drafted for state and local STEP administrators and are included in Appendix B. Each interview question addressed one or more of the research questions. (Refer to Chart 3.1.) All responses to interview questions were compared with information obtained from official STEP program documents such as funding proposals, program reports, and meeting minutes. Some of the research questions/sub-questions were addressed by using interview data as a whole, not just from one or two questions.

**Chart 3.1. STEP Interview Questions**

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Interview Questions for State Administrators</th>
<th>Interview Questions for Program Site Administrators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the STEM career development for youth program as designed?</td>
<td>1. When did the program begin?</td>
<td>1. When did your STEP begin?</td>
</tr>
<tr>
<td>a. How long has the program been in existence and what are the program objectives?</td>
<td>2. How long have you been involved in the program?</td>
<td>2. How long have you been involved in the program?</td>
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<tr>
<td>b. What policy assumptions does the program reflect?</td>
<td>3. What are the main purposes of the program?</td>
<td>3. What are the main purposes of the program?</td>
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<td></td>
<td>a. Are the purposes in official written form? [formal purposes]</td>
<td>a. Are the purposes in official written form? [formal purposes]</td>
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<td></td>
<td>Are there any purposes of the program that are not formally written down but understood by administrators as objectives of the program? [informal purposes]</td>
<td>Are there any purposes of the program that are not formally written down but understood by administrators as objectives of the program? [informal purposes]</td>
</tr>
<tr>
<td>Research Questions</td>
<td>Interview Questions for State Administrators</td>
<td>Interview Questions for Program Site Administrators</td>
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<tr>
<td>4. Are the purposes at the local STEP sites the same as your state-level objectives?</td>
<td>4. Are the purposes at the state level the same as your local site-level objectives for the program?</td>
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<tr>
<td>2. To what extent does implementation of the program by state-level administrators align with the program as designed? a. If there are differences between the program as designed and the program as implemented by state-level administrators, what are the reasons for these differences?</td>
<td>5. Is there a formal, written set of guidelines for implementing STEP? a. What are the guidelines followed by your office?</td>
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<tr>
<td>5. Is there a formal, written set of guidelines for implementing STEP? a. What are the guidelines followed by your office?</td>
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<td>6. Are there informal practices that shape implementation of STEP? If so, can you provide any examples? [Note: For example, an informal way of doing things that has evolved over time to be standard practice.]</td>
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<td>7. What are some examples of how the STEP sites have carried out the State’s goals for the program?</td>
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<td>8. What are some examples of STEP initiatives that have resulted in outcomes that were different than what the State expected?</td>
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<tr>
<td>b. What types of challenges confront program administrators at the state level?</td>
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<tr>
<td>9. What have been the main challenges of implementing STEP? Please discuss challenges encountered in your office and challenges that you may be aware of at the STEP sites. [Note: If interviewee asks for clarification, examples might include capacity issues such as financial resources, training and will issues such as morale and motivation. Communication might be another issue.]</td>
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<tr>
<td>10. Have there been any key changes to the program over time? If so, what are these and how and why were these</td>
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<tr>
<td>10. Have there been any key changes to the program over time? If so, what are these and how and why were these</td>
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<td>3. To what extent does implementation of the program by the program sites align with the</td>
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<tr>
<th>Research Questions</th>
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<th>Interview Questions for Program Site Administrators</th>
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<tr>
<td>program as designed at the state level? changes made? changes made?</td>
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<tr>
<td>a. If there are differences between the program as designed and the program as implemented by the program sites, what are the reasons for these differences?</td>
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<tr>
<td>4. What are the overall strengths and weaknesses of the program in terms of the fundamental program design? [Discuss strengths and also problems with any of the assumptions underlying the program design. For example, are any of the assumptions underlying the program design faulty? Are any elements missing that should be a part of the program design?]</td>
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<td>5. What are the overall strengths and weaknesses of the program in terms of how the program has been implemented?</td>
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<td>6. What are the implications of the research findings for future research and policymaking regarding career development programs focused on recruiting and preparing youth for STEM occupations?</td>
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<td>11. If you think about both the original purposes and the actual implementation of STEP, what are the main strengths of the program at the state level? a. What are the main weaknesses of the program at the state level? 12. What are the strengths and weaknesses of the program at the STEP sites?</td>
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<tr>
<td>13. Are there any changes that you think should be made to STEP – at the state level, local sites, or both? Why? 14. If you were able to make up to three major changes to STEP, would you do so? If so, what would they be? 15. In conclusion, is there anything else about STEP and how it is being implemented that you would like to share?</td>
<td></td>
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<tr>
<td>13. Are there any changes that you think should be made to STEP – at the state level, your local site, or both? Why? 14. If you were able to make up to three major changes to STEP, would you do so? If so, what would they be? 15. In conclusion, is there anything else about STEP and how it is being implemented that you would like to share?</td>
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</table>
Research Validity and Reliability

When conducting research that analyzes qualitative data, challenges associated with anecdotes that may not be valid or reliable emerge. Ensuring collection of valid data can be a challenge, but not an insurmountable one. Studying four STEP sites and identifying patterns in the data both within and across the sites enhanced confidence in the study findings. In addition, data that may have initially appeared trivial or insignificant became more pertinent to the study after careful analysis of all four cases (Silverman 2010).

The study involved triangulation of data; that is data about the same phenomenon collected from multiple sources rather than from a single source. For the NYSED part of the study, the same interview protocol was administered to more than one NYSED official. At each STEP site, several individuals were interviewed about the program at that site. Findings obtained from NYSED officials about STEP’s implementation of policies were compared with findings obtained from the STEP site personnel. Moreover, the interview data were compared with the official document data. Completing semi-structured interviews about the same phenomenon with multiple research participants, and analyzing websites and reports that document the design of STEP and its implementation, boosted confidence in the validity of the study findings.

Potential Limitations

As discussed in Chapter 2, there is a need for new research to address how STEM career development programs can increase the numbers of historically underrepresented ethnic minorities. Additional exploration and an understanding of how policy implementation practices impact outcomes regarding the historical underrepresentation of
ethnic minorities and women in STEM fields is certainly needed (National Science Foundation 2008; Stone 2009). However, a direct, comprehensive focus on such outcomes was beyond the scope of this study.

**Summary**

This chapter described the research design and methodology for the study of how policies are implemented at four STEP sites. STEP serves economically disadvantaged youth who are interested in pursuing STEM careers. The program is administered across New York, a state with a highly professionalized bureaucratic structure and growing productivity in the STEM industry (Merton 1957; Benjamin and Benjamin 2006; Geiger and Sa’ 2008; Metrics for Success Task Force 2009). The focus of the multiple-case study was to examine alterations in policy implementation across STEP sites. It was anticipated that STEP policies as designed would undergo changes upon implementation.

The participating sites were chosen through a purposive sampling of the 60 statewide STEP sites, beginning with a list of 15 potential sites for the study. These 15 sites included post-secondary institutions that emphasize STEM courses of study and have implemented STEP for at least 10 years. The list was also developed based on the sites’ proximity to the Capital Region area. (See Appendix C for a list of proposed STEP sites for the study.)

Research participants were sought until consent was secured from four sites. Two of the STEP sites were sponsored by post-secondary institutions that are private – one was located within New York City; the other was in upstate New York. The last two STEP sites were housed within public campuses – a New York City campus and a public upstate campus. Differing constituencies and governance structures of private and public
universities can impact how post-secondary institutions design and implement policies (White 2003; American Association of Dental Schools 2008). Differences between how organizations are administered in New York City and the rest of the state can also impact policy implementation (Callan and Bowen 1997).

Data collection included obtaining documentation of STEP policy implementation such as program mission statements and grant applications. Face to face, semi-structured interviews of NYSED officials and program administrators at the four STEP sites were also conducted. The total number of interview participants was 21.

Plans to study four STEP sites were made in order to increase the validity of the expected findings. Comparisons within and across sites emerged. Triangulation of data was also a cornerstone of this proposed study. At each site, data was collected from multiple sources – interviews and official documentation – rather than from a single source.
CHAPTER 4: FINDINGS AND ANALYSIS

This chapter analyzes data gathered from interviews with STEP administrators, STEP documents, and information from NYSED’s website. Four NYSED officials – including three current and one former staff member – were interviewed to gather information on STEP’s statewide program administration. The former NYSED official was instrumental in gathering information about the Regents’ proposal paper that advanced the legislation that led to STEP’s creation. The Regents’ proposal paper and state legislation are two of the program documents analyzed in this section.

The findings include information from discussions with local STEP administrators and/or staff who assisted in implementing four of the 60 local 2011-2015 STEP initiatives. (See Appendix C for a listing of 2011-2015 STEP sites.) The findings are also derived from the four local STEP sites’ 2011-2015 grant proposals, the websites of sponsoring universities, and materials distributed to the public to promote STEP sites. Interviews were conducted with at least four administrative staff who work at each of the four STEP sites. All study participants received a draft transcript of their interview in order to expand or amend their comments.

To maintain confidentiality of the persons interviewed, the four sites that participated in this study are referred to as Site A, Site B, Site C, and Site D.

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5 Sponsoring universities are post-secondary institutions that house STEP sites and provide at least a 25% match of supporting funds or assistance (NYSED 2010a).
Research Questions

The interview data consist of responses to a series of semi-structured questions that were drafted in order to answer six research questions. In this section, each research question is listed followed by the interview questions posed to the STEP administrative staff at each of the four sites.

The first research question: What is the New York State STEP initiative as designed? a. How long has the program been in existence and what are the program objectives? b. What policy assumptions does the STEP initiative reflect?

The following interview questions were posed to address this research question:

• When did your STEP begin?
• How long have you been involved in the program?
• What are the main purposes of the program?
  o Are the purposes in official written form? [formal purposes] Are there any purposes of the program that are not formally written down but understood by administrators as objectives of the program? [informal purposes]
• Are the purposes at the state level the same as your local site-level objectives for the program?

The second research question: To what extent does implementation of the program by state-level administrators align with the program as designed? a. If there are differences between the program as designed and the program as implemented by state-level administrators, what are the reasons for these differences? b. What types of challenges confront program administrators at the state level?

The following interview questions were asked to address this research question:
• Is there a formal, written set of guidelines for implementing STEP?
  o What are the guidelines followed by your office?

• Are there informal practices that shape implementation of STEP? If so, can you provide any examples?

• What are some examples of initiatives at the state level that help your STEP site to carry out the State’s objectives for the program?

• What are some examples of STEP initiatives at your site that have resulted in outcomes that were different than what the State expected?

• What have been the main challenges of implementing STEP?
  o Please discuss challenges encountered in your office and challenges that you may be aware of at the state level.

The third research question: To what extent does implementation of the program by the program sites align with the program as designed at the state level? a. If there are differences between the program as designed and the program as implemented by the program sites, what are the reasons for these differences?

  The following interview question was asked to address this research question:

  • Have there been any key changes to the program over time? If so, what are these and how and why were these changes made?

The fourth research question: What are the overall strengths and weaknesses of the program in terms of the fundamental program design? The fifth research question is as follows: What are the overall strengths and weaknesses of the program in terms of how the program has been implemented?
The following interview questions were asked to address both of the latter research questions:

- If you think about both the original purposes and the actual implementation of STEP, what are the main strengths of the program at the state level?
  - What are the main weaknesses of the program at the state level?
- What are the strengths and weaknesses of the program at your own site?

The sixth and last research question: What are the implications of the research findings for future research and policymaking regarding career development programs focused on recruiting and preparing youth for STEM occupations?

The following interview questions were asked to address the last research question:

- Are there any changes that you think should be made to STEP – at the state level, your local site, or both? Why?
- If you were able to make up to three major changes to STEP, would you do so? If so, what would they be?
- In conclusion, is there anything else about STEP and how it is being implemented that you would like to share?

**Review of Research Questions**

Data that address each research question are described in this part of Chapter 4. To maintain confidentiality of the interviewees, some information provided about the STEP sites is purposely presented as approximations rather than precise numbers. This includes data cited in this chapter about the number of youths served.
Findings and Analysis for Research Question 1:

1. What is the New York State STEP initiative as designed?  
   a. How long has the program been in existence and what are the program objectives?  
   b. What policy assumptions does the STEP initiative reflect?

**Design and Objectives: Regents’ Action Paper (NYSED 1984)**

“Increasing Minority Access to the Licensed Professions: A Regents’ Action Paper” provided the basis for the legislation that authorized STEP to begin in 1986. The Regents’ Action Paper outlined the collective efforts of state officials and higher education leaders to address increasing access to science, technology, engineering, and math (STEM) professions by three ethnic minorities – Blacks, Hispanics, and Native Americans (NYSED 1984, 3; New York State Senate 1985a).

In the foreword of the Regents’ Action Paper, the Board of Regents of the University of the State of New York (the Regents) stated their strategic intention to eliminate educational barriers for ethnic minorities:

“The Regents are committed to the elimination of barriers which impede the educational development of any person. While the Regents have made this commitment known in a number of statements and legislative proposals and have witnessed some progress toward achieving greater access for minorities and disadvantaged populations, there still exists a severe underrepresentation of minorities in the licensed professions.”

“The Regents strongly endorsed the premise that equal educational opportunity in programs that lead to licensure is the right of all New York State residents. Also, the Regents recognize that minorities and other disadvantaged groups have been historically – and continue to be – denied equal education access and subsequently equal opportunity to participate in the mainstream of American life. . .”

“The Regents recognize that New York State and the nation have a practical as well as a moral stake in achieving the goal of equal opportunity for minorities in professional education programs and ultimately, professional practice. In the interest of all New Yorkers, we commit ourselves to the school. We have studied and talked about the problem too long; the time for action is now” (NYSED 1984, vii).
The Regents’ statement of commitment in 1984 was also quoted in the STEP Field Manual and the STEP Operations Manual (NYSED 2012e, 2012g). The prior “statements and legislative proposals” referred to in the Regents’ declaration are listed in Table 4.1 and demonstrate a marshaling of policy resources over an extended period of time (Smith and Larimer 2009). (See Appendix D for a listing of the Regents and NYSED staff members in 1984.)

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>Minority Access to and Participation in Post-secondary Education (Position Paper 15)</td>
</tr>
<tr>
<td>1980</td>
<td>Regents’ Statewide Plan for the Development of Post-secondary Education</td>
</tr>
<tr>
<td>1980-1981</td>
<td>Regional Conferences</td>
</tr>
<tr>
<td>1981 Legislative Session</td>
<td>Proposed Legislation Advanced</td>
</tr>
<tr>
<td>June 12, 1981</td>
<td>Conference on Minority Access</td>
</tr>
<tr>
<td>Fall of 1981</td>
<td>Special Project on Minority Access to Graduate and Professional Education</td>
</tr>
<tr>
<td>September 9, 1982</td>
<td>Appointment of the Minority Professional Education Coordinator’s Position</td>
</tr>
</tbody>
</table>

In addition to the Regents and NYSED playing a substantive role in supporting the policies espoused in the Regents’ Action Paper, Governor Mario Cuomo, the New York State Assembly’s Higher Education Committee, the Black and Puerto Rican Legislative Caucus (currently named the Black, Puerto Rican, Hispanic and Asian Legislative Caucus) (New York State Senate 2012), and New York University were also key supporters. One of the architects of the paper, a former NYSED employee, described
the process that was undertaken to provide the data-driven policies outlined in the Regents’ Action Paper:

“So my initial three to six months were primarily spent working on... the Governor’s Commission on Minorities in Medicine. And then my work with all of the professional boards including medicine. But my initial emphasis, because of the Governor’s Commission, was on medicine."

“When as part of my research I found that the reasons that they were giving me – at least in many of the licensed professions – that they didn't have more so-called minorities was because they didn't have the prerequisite background in math and science to be able to come into those programs. And those who did, did not have the level of preparation that they needed to be retained. So they were dropping out even if they were admitted to medical schools.”

“So I found that initially starting at the medical school level may not have been the issue. It may have been in fact what I called a ‘pipeline’ issue. . .spelled out in the [Action] paper. . .” – Former NYSED Administrator

The policies prescribed in the Regents’ Action Paper were crafted to address this pipeline issue in a systematic fashion.

**Policy Assumptions: Regents’ Action Paper**

The Action Paper outlined a number of policy assumptions asserted by the Regents regarding “pipeline” problems associated with access of ethnic minority and economically disadvantaged youth to STEM fields. The problems and associated policy assumptions that were outlined in the Regents’ Action Paper are listed and grouped in Table 4.2. They are categorized based on the four areas of research described in Chapter 2 that guided this investigation of how career development policies for STEM youth programs are implemented: career, self-concept, social capital, and policy implementation studies:
As indicated in Table 4.2, the Regents assumed that the problem of access to the STEM fields by ethnic minorities was multi-dimensional:

“Clearly the problem is . . . indicative of a larger societal ill stemming from a variety of intentional and unintentional discriminatory practices, past and present, that adversely affect the social, educational, political, and economic development of ethnic minorities” (NYSED 1984, 4).

Assembly Bill 1344 and its counterpart, Senate Bill 960, passed both of New York State’s legislative chambers. The policies of the Regents’ Action Paper to improve development of ethnic minorities were incorporated into the passed legislation. On April 3, 1985, funding for STEP was approved (New York Senate 1985b; NYSED 2012c).

Groups listed in support of Senate Bill 960 included NYSED, the Commission on Independent Colleges and Universities, the Associated Medical Schools of New York, the State University of New York, the City University of New York, the New York State Department of Health, the New York State United Teachers, the Board of Education of

More than two decades later, STEP’s policies reflect the Regents’ recommendations and strategies for addressing the multi-dimensional problem outlined in the Regents’ Action Paper. See Table 4.3 for a summary of the Regents’ recommendations.

Table 4.3. Summary of Regents’ Recommendations (NYSED 1984, xi)

<table>
<thead>
<tr>
<th>All Levels of Education</th>
<th>Elementary/Secondary Education</th>
<th>Undergraduate Education</th>
<th>Graduate and Professional Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>“That formal mechanisms be established, both at the regional and state level, to assure that local educational agencies, public libraries, professional groups, institutions of higher education and the State Education Department, collaborate on activities designed to significantly increase the proportion of minorities in the licensed professions on both the short-term and long-term basis.”</td>
<td>&quot;That elementary and secondary educational institutions make special efforts to prepare and retain minority students and educational programs that are required for admission to, and for successful completion of, pre-professional and professional education programs. Efforts to combat attrition among minorities must begin at the preschool and elementary school levels and continue throughout the high school years.&quot;</td>
<td>&quot;That two and four-year educational institutions make special efforts to enroll and assist minority students in educational programs that qualify them for licensure in the professions.&quot;</td>
<td>“That graduate and professional schools make special efforts to increase the enrollment, retention and graduation of minority students in educational programs leading to licensure in the professions.”</td>
</tr>
</tbody>
</table>

The Regents’ strategies for action included 20 coordinated strategies across elementary, secondary, undergraduate, graduate, and professional education levels. These coordinated strategies were presented in the Regents’ Action Paper as part of a “comprehensive and coordinated approach that [requires] the sustained efforts of the educational system, the professional boards, professional associations and societies, State
government, private industry, parent groups and others” (NYSED 1984, vii). The first four strategies were recommended for action across all levels of education and are summarized below.

The first strategy called for the “professions, under the leadership of the State Education Department and State Boards, [to reach] out to minority students at all levels of education, providing information, encouragement and positive role models early in the educational pipeline and instructional and financial assistance at subsequent stages” (NYSED 1984, 7). The establishment and activation of minority access committees that would serve as a resource for increasing minority access to the professions were also recommended as part of Strategy One (NYSED 1984).

The second strategy called for the State, through legislation, to establish and fund regional consortia. The regional consortia would involve all levels of education, the professions, and other interested groups. The regional consortia were also described as supporting implementation of programs like STEP:

“The consortia should be responsible for implementing programs that begin at the earliest point in the educational process and extend through to professional licensure. Programs should be designed to increase student, parent and school awareness of professional opportunities and educational requirements for professional study. Programs should also be pursued which retain minority students in educational activities that are prerequisite for professional study and licensure” (NYSED 1984, 7).

In the Regents’ Action Paper, the establishment of a contractual agreement between the State Education Department and regional groups was also outlined. The agreement specified the type of academic support that would be provided for minority students. Academic enrichment courses in math, science, and English as well as tutoring, counseling, and summer and academic year internships were cited as appropriate
activities. This second strategy also called for regional groups to submit annual plans that describe program goals, objectives, timetables, and activities to NYSED.

The third strategy for action prescribed collaborative activities between NYSED and other state agencies to develop additional educational training for minority staff so that they could qualify for professional licensure (NYSED 1984).

The fourth and final strategy recommended the creation of an external advisory committee to the Commissioner of Education. This committee would be responsible for developing and implementing strategies to increase the numbers of licensed minority professionals in New York State. The advisory committee was to include “representatives from State government, community-based organizations, professional boards and associations, parent groups, educational institutions, private industry, philanthropic foundations and other groups interested in improving representation of minorities and professional training and practice” (NYSED 1984, 6).

The Regents’ Action Paper’s recommendations and strategies were not meant to be “fully prescriptive responses to the myriad complex problems.” However, they were viewed as “fundamental and essential” to ensuring greater access for minorities to the professions (NYSED 1984, x-xi).

Findings and Analysis for Research Question 2:

2. To what extent does implementation of the program by state-level administrators align with the program as designed? a. If there are differences between the program as designed and the program as implemented by state-level
administrators, what are the reasons for these differences? b. What types of challenges confront program administrators at the state level?

State-level Implementation and Program Design

The New York State Department of Education’s office of K-16 Initiatives and Access Programs housed in the Pre-Collegiate Preparation Programs and Scholarships Unit (PCPPSU) was responsible for the statewide administration of STEP. The “Purpose and Program Services” section of PCPPSU’s website included a description of STEP’s objectives. The description of STEP’s purpose and intended activities on PCPPSU’s website was consistent with the intended focus of the program outlined in the Regents’ Action Paper and the legislation that was passed to create STEP. See Table 4.4 for a description of STEP’s student eligibility criteria and intended activities for the academic year and summer components.

Table 4.4. STEP’s Eligibility Criteria and Intended Activities (NYSED 2012a)

<table>
<thead>
<tr>
<th>Eligibility Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enrolled in Grades 7-12</td>
</tr>
<tr>
<td>• Economically disadvantaged&lt;sup&gt;6&lt;/sup&gt;, or African-American, Hispanic/Latino, Alaskan Native or American Indian and will benefit from academic enrichment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intended Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Core subject (science and mathematics) instruction/Regents exam preparation</td>
</tr>
<tr>
<td>• Supervised practical training</td>
</tr>
<tr>
<td>• Supervised research training</td>
</tr>
<tr>
<td>• College admissions counseling and assistance with college application process</td>
</tr>
<tr>
<td>• Standardized tests preparation</td>
</tr>
<tr>
<td>• Career awareness/development activities</td>
</tr>
<tr>
<td>• Summer programs</td>
</tr>
</tbody>
</table>

<sup>6</sup>“Economically disadvantaged” refers to an individual whose family's taxable income for the preceding year did not exceed 150 percent of the poverty level amount. The U.S. Department of Health and Human Services determines the poverty levels; family income levels are determined by the U.S. Census Bureau. For example, as of January 20, 2011, a family of three with an income below $27,795 would qualify as meeting low income levels in the 48 contiguous states and DC.
The website also featured the demographic makeup, academic progress, and career interests of students served during STEP’s 2010-2011 program year. Based on this NYSED data STEP, in program year 2010-2011, served 5,319 females and 3,186 males. In sum, of the 8,505 students served that year 63% were female and 38% were male.

The largest ethnic groups served were African-American and Latino students, or 7,616 youths, who collectively made up 90% of student enrollment. The next three largest ethnic groups served included students who self-identified as Asian, Caucasian, and American Indian/Alaskan Native. Each of these three groups comprised approximately 3% of the STEP student population.

Less than 600 or 6% of all enrolled STEP youth participated in STEP based on economic disadvantage.7 (See Table 4.5 for a complete listing of student data for the STEP 2010-2011 program year by demographic makeup.)

Table 4.5. STEP Demographic Student Data (NYSED 2012a)

<table>
<thead>
<tr>
<th>Program Year 2010-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Students served (grades 7-12)</td>
</tr>
<tr>
<td>African-American</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Bi-Racial/Multi-Racial</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Other/Unknown</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total Number of Economically Disadvantaged</td>
</tr>
<tr>
<td>Students</td>
</tr>
</tbody>
</table>

In program year 2010-2011, STEP also served fewer middle school than high school students, 22% versus 78%. This may be due in large part to the 2010-2011

7 Economically disadvantaged youth do not have to be of African-American, Hispanic/Latino, or American Indian/Alaskan Native descent.
program year being the first that STEP sites were mandated to include seventh and eighth
graders in their activities. This new mandate was consistent with the Regents’ Action
Paper’s strategies to impact the educational pipeline by reaching students well before
they enter high school. (Refer to Table 4.6.)

<table>
<thead>
<tr>
<th>Program Year 2010-2011 / Participants by School Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th / 821</td>
</tr>
<tr>
<td>8th / 1,011</td>
</tr>
<tr>
<td>9th / 1,478</td>
</tr>
<tr>
<td>10th / 1,630</td>
</tr>
<tr>
<td>11th / 1,814</td>
</tr>
<tr>
<td>12th / 1,751</td>
</tr>
</tbody>
</table>

Approximately 16% of STEP students, or 1,366 youth, during the 2010-2011
program year participated in internships and 29% conducted research projects. (See
Table 4.7.) In the 2011-2012 STEP Final Report Form a student internship or research
project was described as a paid or unpaid experience that directly relates to scientific,
technological, and health-related careers as well as the licensed professions (NYSED
2012c). (See Appendix E for the list of professions that are licensed, registered or
certified by the Regents.)

Interview data from all four STEP sites, discussed later in this chapter, indicated a
lack of funding to support the attendance of greater numbers of students in the statewide
STEP student research conference. The majority of STEP students, 5,474 or 64%,
participated in counseling, followed by 4,626 or 54% of STEP youth who received
tutoring. Four types of counseling were listed in the 2011-2012 STEP Final Report Form:
personal, financial, career, and academic. Math, science, and language arts were listed as
model subjects for tutoring sessions (NYSED 2012d).
Table 4.7. STEP Internships, Research Projects, Counseling, and Tutoring (NYSED 2012a)

<table>
<thead>
<tr>
<th>Student Participation</th>
<th>Program Year 2010-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internships</td>
<td>1,366 students</td>
</tr>
<tr>
<td></td>
<td>68,671 hours</td>
</tr>
<tr>
<td>Research</td>
<td>2,452 students</td>
</tr>
<tr>
<td></td>
<td>154,397 hours</td>
</tr>
<tr>
<td>Counseling</td>
<td>5,474 students</td>
</tr>
<tr>
<td></td>
<td>82,285 hours</td>
</tr>
<tr>
<td>Tutoring</td>
<td>4,626 students</td>
</tr>
<tr>
<td></td>
<td>79,467 hours</td>
</tr>
</tbody>
</table>

The majority of STEP students, 6,601 or 78%, had an academic average of 80% or better during the 2010-2011 program year. (See Table 4.8.) Of the 1,011 eighth graders enrolled in STEP during that program year, approximately 30% scored a level 3 or 4 on New York State’s Grade 8 math and English Language Arts assessments. (See Table 4.9.) Students who scored at a level 3 or 4 demonstrated the ability to perform at a college level. Level 4 is the highest score students can achieve on the Grade 8 assessments (NYSED 2010b).

During the 2010-2011 program year, approximately 21% of the STEP eighth graders scored a level 3 or 4 on the New York State’s science assessment. Based on interview data, by the time STEP students entered their final years of high school they outperformed their peers in a number of areas, including their grades in Regents mathematics and science courses and the number of Regents diplomas obtained. Interview data was consistent with language in the “STEP Results” portion of PCPPSU’s webpage which cited that STEP students outperform their peers in standardized testing (NYSED 2012a).
Table 4.8. STEP Students’ Academic Averages (NYSED 2012a)

<table>
<thead>
<tr>
<th>Student Academic Average</th>
<th>2,516 students</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>89-80</td>
<td>4,085 students</td>
<td>48%</td>
</tr>
<tr>
<td>79-70</td>
<td>1,090 students</td>
<td>13%</td>
</tr>
</tbody>
</table>

Table 4.9. STEP’s Statewide Assessment Results for Eighth Graders (N=1011) (NYSED 2012a)

<table>
<thead>
<tr>
<th>Program Year 2010-2011</th>
<th>Math</th>
<th>English Language Arts</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 2</td>
<td>130 students</td>
<td>Level 2</td>
</tr>
<tr>
<td></td>
<td>13%</td>
<td>13%</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>Level 3</td>
<td>235 students</td>
<td>Level 3</td>
</tr>
<tr>
<td></td>
<td>23%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Level 4</td>
<td>70 students</td>
<td>Level 4</td>
</tr>
<tr>
<td></td>
<td>7%</td>
<td>7%</td>
<td>7%</td>
</tr>
</tbody>
</table>

During the 2009-2010 program year, 97% of all STEP twelfth graders or 1,706 youths graduated from high school. Of that number, almost 90% graduated with an Advanced Regents diploma and 70% indicated that they intended to attend college in order to pursue a math, science, or technology degree. (See Table 4.10.) According to one NYSED administrator, NYSED staff have had discussions regarding how to institute a way to track STEP students’ acceptance into college, their majors and the post-secondary degrees they pursue.

As of the 2010-2011 program year, NYSED did not have a way of tracking post-secondary data unless students self-reported their progress. Examples of this type of student self-reporting are featured in the *APACS Inc. Presents: Impact: STEP and C-STEP* video (APACS 2009).⁸

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⁸ One of the NYSED administrators interviewed for this study provided a copy of the APACS video.
The Association for Program Administrators of C-STEP and STEP (or APACS) were formed in 1997. One of APACS’ primary goals was to support and promote STEP policies (APACS 2012b). Testimonials of STEP alumni who have pursued STEM careers were also featured on the STEP for Leaders Students in Action Portal – a website sponsored by APACS (APACS 2012a; NYSED 2012f).

Table 4.10. Program Year 2009-2010 Follow-up on STEP Graduate Placements (NYSED 2012a)

<table>
<thead>
<tr>
<th>Graduates</th>
<th>97%</th>
<th>1,706</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates with Advanced Regents Diploma</td>
<td>88%</td>
<td>1,504</td>
</tr>
<tr>
<td>College-Bound Graduates</td>
<td>96%</td>
<td>1,682</td>
</tr>
<tr>
<td>NYS College Bound</td>
<td>72%</td>
<td>1,261</td>
</tr>
<tr>
<td>College-going Graduates Pursuing Math, Science, or Technology</td>
<td>70%</td>
<td>1,236</td>
</tr>
</tbody>
</table>

The description of STEP’s purpose and intended activities on the PCPPSU’s website was consistent with the intended focus of the program outlined in the Regents’ Action Paper and the legislation that was passed to create STEP.

**Alignment Differences and Challenges in Implementation**

The Science and Technology Entry Program design was shaped by legislation (New York State Senate 1985a) signed into law by Governor Mario Cuomo in 1985. One of the state interviewees explained:

“The RFP [is] led by the Legislature. . .The legislation serves as a framework for how the RFP is put together.⁹ Although there are some things that we can tweak a little, unless the legislation changes we can’t go totally out of the realm. . . For example, the legislation [mentions] licensed professions. We expanded it to include science and math professions and teaching. . .Without teachers of science and math we wouldn’t be able to have more professionals. . .This is still within the framework.” – State Administrator 2

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⁹ RFP stands for “request for proposal.”
The STEP guidelines were prescribed in the authorizing legislation and this has helped to facilitate the program’s alignment with the fundamental program design. If there were any major questions or concerns regarding how the program was being implemented, any state or local STEP staff member could refer to the legislation for guidance. This ensured that any changes made to STEP did not contrast sharply with the Regents’ intended program.

When interviewees were asked about any modification to how the program was originally designed and its current implementation, three themes emerged. State-level administrators pointed out additions to the program design such as (1) regional representatives, (2) statewide STEP student research conferences, and (3) Day of Service activities for non-STEP students.

**Regional representatives.** The state-level administrators who participated in this study described a statewide network that has been put in place to support the alignment of the local program with its original design:

“This is something that you won’t find on our website. STEP has a statewide network that covers ten regions. . .There are ten regional [representatives]. Once a month we have a teleconference call. . .We discuss reports they have from the other directors in their areas. That way they help us identify any problems so we can discuss them right away. . .Our statewide network is a key part of our success. There’s mentoring of the field by committee chairs. . .” – State Administrator 1

As NYSED experienced increased staff shortages, the role of regional representative was implemented to assist state-level administrators in their oversight of the local STEP sites. Each region had a regional representative and an alternate regional representative assigned to it. The regional representative and alternate role were filled by
sitting STEP and C-STEP site administrators. Table 4.11 lists the official regions which spanned 71 colleges or universities that were awarded either a STEP or a C-STEP grant. The number of post-secondary institutions that were part of the region and the number of these institutions that had at least a STEP grant at that time are also provided in Table 4.11. For the 2011-2012 program year, 80% or 56 sites were awarded a STEP grant and approximately 46% or 32 of the 70 sites had both STEP and C-STEP grants.

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Colleges/ Universities in Region</th>
<th>Colleges/Universities with a STEP Grant</th>
<th>Colleges/Universities with a STEP and C-STEP Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn, Staten Island, Queens</td>
<td>12</td>
<td>11 92%</td>
<td>6 50%</td>
</tr>
<tr>
<td>Buffalo</td>
<td>3</td>
<td>3 100%</td>
<td>2 67%</td>
</tr>
<tr>
<td>Capital District</td>
<td>5</td>
<td>5 100%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Central New York 1</td>
<td>4</td>
<td>1 25%</td>
<td>1 25%</td>
</tr>
<tr>
<td>Central New York 2</td>
<td>8</td>
<td>3 38%</td>
<td>1 13%</td>
</tr>
<tr>
<td>Long Island</td>
<td>10</td>
<td>10 100%</td>
<td>7 70%</td>
</tr>
<tr>
<td>Mid Hudson</td>
<td>5</td>
<td>4 80%</td>
<td>3 60%</td>
</tr>
<tr>
<td>New York City/ Manhattan, Bronx</td>
<td>14</td>
<td>13 93%</td>
<td>6 43%</td>
</tr>
<tr>
<td>Northern New York</td>
<td>4</td>
<td>2 50%</td>
<td>2 50%</td>
</tr>
<tr>
<td>Rochester</td>
<td>5</td>
<td>4 80%</td>
<td>3 60%</td>
</tr>
</tbody>
</table>

The regional representative role was not a necessity when STEP was first implemented in the mid-1980s. During the beginning of the program, extensive travel was part of the job description of STEP’s state-level administrators. However, due to budget cuts, regular site visits were no longer the standard:

10 C-STEP, discussed in Chapter 1, is STEP’s sister program that serves historically underrepresented ethnic minorities and economically disadvantaged students in college.
“We used to be able to set up our own travel schedule to do site visits. Over the years the number of people who worked the programs diminished. The programs are limited by how much we can travel. This impacts how we can go to programs. If there’s a problem, we can generally go. There really isn’t money for travel. Another is the staffing levels. We’re at a point of no return. Most programs only have one person. If that person retires, dies or takes another job, their responsibilities have to be moved to someone else with a full-time job.” – State Administrator 2

Another administrator described the burden on the state and field levels:

“STEP and C-STEP used to be one Bureau by itself. They had eight or nine staff. Now there’s only one... We can’t get out to the field for monitoring, for compliance and technical assistance... We’re swamped in keeping up with paperwork. That’s significant.” – State Administrator 3

NYSED staff depended on the regional representatives to convey information that encouraged statewide alignment of the local programs with the fundamental guidelines of STEP.

**Statewide STEP student research conferences.** The state-level interviewees also discussed the annual statewide STEP student research conference in Albany. Each year students have had an opportunity to identify, research, and showcase a problem such as ways to eliminate waste or a toxin that is impacting the community. One administrator described how the idea for the conference came about and gave an example of an exemplary student project:

“There is nothing in our guidelines about student conferences. [Two staff members] came up with the ideas, along with other staff and pushed that forward. It was not in the original legislation or RFP... A student did research measuring the number of chemical particles there are in your closet after placing [dry cleaned] clothes in the plastic inside. [Based on the student’s findings.] you should hang your dry cleaning in the garage first... An eighth grade student did this. It has changed the way I store my clothes...” – State Administrator 3

This administrator also commented on the impact the conferences have had on STEP students’ motivation to excel and their ability to showcase their knowledge:
“The conference makes the students more eager to do their best. . .STEP has about 9,000 students. All of them can’t come. . .But they want to come so they are motivated to get their grades up. . .The student conference gives them confidence in the ability to do the work and practice their presentation skills. They must explain in great detail their research, how it all came about. They must use language simple enough for people to understand. . .It gives a lot of students – urban, suburban, rural – the chance to get out of their little niche. . .We take them from Brooklyn, Plattsburgh, all over. . .The [students’ challenges] are the same to different degrees: inequitable education, poverty, being hungry. . .” – State Administrator 3

Although one of the main focuses of STEP was to provide experiences that would give students greater access to STEM career pathways, like participation in the STEP student research conferences, most STEP students were unable to participate in the conferences. Providing the opportunity for increased student participation has been a challenge at the state level:

“We’ve had a few [sites choose] not participate in statewide student conferences. But probably the majority do. . .Out of 60 sites, maybe some 40 participated. . .There are different factors why they may not participate. Some programs are funded at low amounts. So it would be difficult for them. There could be a lot of reasons [for staff who] don’t want to take students out of town. There may be concerns regarding [student] safety issues. Concerns regarding [taking] responsibility for the students [during overnight trips].” – State Administrator 2

Students and/or their sites who participated in STEP’s statewide student research conference had to be able to budget for the transportation and hotel costs associated with the event in Albany. The STEP sites that were not able to send most of their students to the statewide student research conference had to find other ways to meet NYSED’s expectations to expose the students to research opportunities. These opportunities included participation in science bowls that were more cost effective to attend because they were closer to the sites’ local communities.11

11 A science bowl is an academic competition in which students compete for prizes by demonstrating their mastery of science.
**Day of Service activities for non-STEP students.** Another difference between the program as designed and the program as implemented by state-level administrators was the incorporation of Day of Service activities within the STEP Field Manual, STEP Operations Manual, and 2011-2015 proposal for funding (NYSED 2012a, 2012c, 2012d). This modification in program implementation was put in place to provide a larger number of students with information about STEM careers. According to the STEP Field Manual, the mission of the Day of Service activities was to disseminate information about STEM careers to students who were not currently served by STEP (NYSED 2012e). Students in grades 6-12 were invited to attend Day of Service activities along with their parents and school counselors.

According to one state-level administrator, the sites’ participation in Day of Service Activities started in 2008. The Day of Service activity was officially incorporated in the program oversight materials for the 2011-2015 STEP grant cycle. These materials were used by the local STEP site administrative staff to implement their programs.

**CASE STUDY ONE**

The preceding discussion addressed Research Questions 1 and 2. The following discussions of the four case study sites address Research Questions 3-6.
Findings and Analysis Data for Research Question 3: SITE A

3. To what extent does implementation of the program by the program sites align with the program as designed at the state level? a. If there are differences between the program as designed and the program as implemented by the program sites, what are the reasons for these differences?

Alignment of Local-level Implementation and Program Design

Site A received its first grant in 2000 to help pre-collegiate, underrepresented ethnic minorities in STEM fields, as well as economically disadvantaged students of any ethnicity, succeed academically. Serving this population is consistent with the original policy design in the STEP legislation (New York State Senate 1985a). Prior to NYSED changing its academic target to include seventh and eighth grade students starting in the 2011-2012 grant cycle period, Site A did not serve middle school students. Of the four STEP sites that participated in this study, Site A served the second largest number of students, between 200 and 400 students, during the 2011-2012 program year. Table 4.12 has additional information about youth served by Site A.

Table 4.12. Background of Site A – Program Year 2011-2012

<table>
<thead>
<tr>
<th>Type and Location</th>
<th>Private Post-Secondary Institution, Upstate New York Administrative STEP Offices on Campuses of the University and Secondary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Youth Served</td>
<td>150 – 300</td>
</tr>
<tr>
<td>Participating Youth in STEP Student Research Conference</td>
<td>Yes (number of youth not specified)</td>
</tr>
<tr>
<td>Reported Impact of Day of Service Activities</td>
<td>3,000 – 5,000 middle and high school students contacted</td>
</tr>
</tbody>
</table>
Five staff persons who played a role in implementing the STEP initiative at Site A were interviewed: the director of the Office of K-12 Partnerships at the sponsoring university, the STEP director, two STEP coordinators and the STEP and C-STEP regional representative for the local site’s area. Site A was operated out of the sponsoring university’s Office of K-12 Programs. Site A’s STEP was a school-based program that was located in upstate New York and sponsored by a private post-secondary institution.

The program’s purpose to serve underrepresented students in STEM fields was consistently stated across interviews. Two interviewees remarked about the guidelines for the program’s eligibility criteria:

“The big one is student eligibility, which really has to go along with NYSED guidelines. . .it’s the ethnicity. . .the underrepresented students in STEM fields are African-American, Latino, Native American, Alaskan and economically disadvantaged students of any ethnicity.” – Local Administrator 1, Site A

“We definitely have more African-American students. . .it still is, the majority, African-American, but it is changing. There is a high population of Muslim [Middle Eastern] students from our district. . .[The groups of] Caucasian students [and] Hispanics are not very big in my school district. I do have a few Alaskans, Native Americans. But I would say the [number of] Muslims have really picked up. And so has the [number of] Caucasians in our school district and I think that people’s lives are changing so. If they don’t get in because of their race and ethnicity then we’re definitely getting them in because of their income. . .” – Local Administrator 2, Site A

Although some of the secondary schools that Site A served did not have large numbers of Latino or Hispanic students, others did. The 2011-2015 STEP requirements and priorities cited guidelines for all of the STEP sites as they worked to provide increased outreach to ethnic minorities that are historically underrepresented in STEM fields.
STEP Requirements and Priorities

The 2011-2015 STEP grant proposal for all STEP sites included six requirements and three priorities that were scored by NYSED staff based on three competency levels (NYSED 2010a). NYSED’s requirements and priorities are listed in Table 4.13.

Table 4.13. 2011-2015 STEP Requirements and Priorities (NYSED 2010a)

<table>
<thead>
<tr>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide evidence of formal collaborations between the proposing institution and local educational agencies such as local schools and school districts, C-STEP programs, professional organizations, and/or other agencies that will be involved in the project.</td>
</tr>
<tr>
<td>2. Provide program activities to assist students in acquiring the skills and aptitudes necessary to pursue post-secondary education leading to careers in scientific, technical, and health-related fields or the licensed professions.</td>
</tr>
<tr>
<td>3. Prior to graduation, programs must provide services to enhance and increase students’ involvement in research, internships, college-level coursework, and/or service learning.</td>
</tr>
<tr>
<td>4. Provide program services to enhance students’ mathematical and scientific skills in accordance with the Advanced Regents Diploma.</td>
</tr>
<tr>
<td>5. Implement a parental component with clearly defined roles, responsibilities, and activities. Outline the relationship between the parent and the program.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Program services designed to improve recruitment and retention of historically underrepresented male participants in all targeted grade levels.</td>
</tr>
<tr>
<td>2. Program services and activities designed to improve the recruitment and retention of Latino/Hispanic and Native American participants in all targeted grade levels.</td>
</tr>
<tr>
<td>3. Program services designed to improve eighth grade students’ test scores on the New York State Mathematics and Science Assessment Examinations.</td>
</tr>
</tbody>
</table>

For each requirement and priority, sites operated at a beginning, developing or proficient level (NYSED 2010a). If services were not yet provided, the STEP site was functioning at a beginning level for the associated requirement or priority. If some of the described services were provided, but not in all targeted areas, then the site was operating at a developing level. When the site was able to provide services in all targeted areas for a specific requirement or priority, the site was doing so at a proficient competency level.
Prospective STEP grantees had to provide evidence of whether they are meeting each requirement and priority. Sites that did not meet performance measures may have been placed on probation. If these sites did not meet compliance requirements by outlining and completing corrective action steps, future funding for those STEP projects may have been reduced (NYSED 2012e).

The 2011-2015 STEP grant proposal requirements and priorities were consistent with STEP objectives and activities as outlined in the Regents’ Action Paper (NYSED 1984) and the language of the STEP legislation that was signed into law (NYSED 1984; New York State Senate 1985a). NYSED’s requirements and priorities directed STEP sites to partner with parents and educational institutions with similar purposes. The objective of these partnerships included increasing the academic aptitude and knowledge of viable STEM careers among participating students. Ultimately, all students – whether they are enrolled in STEP or not – are supposed to receive greater exposure to information about STEM careers as a result of an active STEP initiative in the local community.

The STEP grantees had to meet all of the NYSED requirements in order to be in compliance with grant expectations (NYSED 2012e). During the grant proposal approval process, preference was given to sites that were able to provide one or more of the three program priorities.

During the Site A interviews, local STEP administrators candidly discussed their opinions about the state requirements and what was involved in meeting NYSED’s expectations. The following sections outline three core program activities and how Site
A’s staff managed these activities: (1) the Parental Component, (2) Day of Service Activities, and (3) University Faculty-led Workshops.

**Parental Component**

In its grant proposal, Site A described its capacity to meet all requirements at a Proficient/Level 3 except for the implementation of a substantive parental component (Requirement 5). For the 2011-2012 program year, Site A described its capacity to partner with parents as being at Level 1. Site A has not developed a parental component but has plans to do so by the third year of the grant cycle and hired a STEP parent as part of the coordination team.

When asked about how Site A has worked to engage parents over the years one administrator who worked for STEP for about seven years at the time of the interview remarked about Site A’s desire to improve its performance in this area:

“We pay for everything...So it’s just unbelievable that more kids don’t [take advantage]...And I understand...they’re juniors. If they have the opportunity to work and their parents want them to work, because they want to work...So those are things that are frustrating to me.” – Local Administrator 1, Site A

The administrator mentioned campus tours during spring break and said:

“I think if we had more parents really paying attention to all of this stuff, they’d be pushing their kids...If parents were able to piece together more of the puzzle. Not that they don’t care, but there are things that they need to do now to get [their children] to be more successful.” – Local Administrator 1, Site A

Another administrator at Site A observed:

“. . .the State’s expectation of outreach to parents is sometimes a lot more ambitious than the sites are able to deliver. And I think it has to do with the fact that we’re working in school districts where one of the greatest issues around student achievement is the lack of parental input. Even though we create programs to bring parents into the fold and have them learn about our program and become advocates for the program to other parents, sometimes our results aren’t what the State would like to see.” – Local Administrator 4, Site A
Another local administrator remarked about the impact a vital parent partnership can create for STEP sites:

“My parents are not involved. There goes problem number one. Maybe it’s not number one, but it’s a huge problem. . .And so when I took the program [I wondered] why aren’t these adults involved? And so we’re putting together a parent group. Now some of our regions statewide actively have strong parent groups. And so I’ve reached out to them to give me ideas on how I can get a group that’s strong. Because I believe – and I don’t know because. . .there’s no data [that I can access], but I’m willing to bet that those regions with the strong parent groups are probably a little bit more active. And they probably reach their goals a little bit quicker than those without strong parental involvement.” – Local Administrator 5, Site A

The data this local administrator could not readily access was NYSED information regarding how each site was meeting the requirements and priorities. This data was not currently accessible by the public unless someone specifically requested it.

**Day of Service Activities**

Site A staff worked with other post-secondary institutions in their region to implement the Day of Service activities or career day featuring information about STEP and the STEM fields. During the Day of Service, STEP staff, professionals from the STEM field, and university professors made STEM career presentations to middle and high school students. One administrator stated that the premise to expose greater numbers of students to substantive information about STEM careers is a good one and also expressed reservations about the coordination workload that is involved when providing the Day of Service:

“[NYSED] came up with this idea that we’re supposed to do a Day of Service. . .A career exploration. Well, I call it that. A Day of Service where you go out and you talk to kids who are not in your program. . .to promote the STEM career fields. And it is good. We should be doing that. But it’s . . .a lot of work. But we do it. And it worked out well. You recruit faculty members from your institution. And they go out to a school. They do a presentation to the masses. . .So we just got over that. We just got
past that. It’s a lot to coordinate. We did two Days [of Service].” – Local Administrator 1, Site A

Another administrator remarked about the opportunity for sites within a region to pool resources so that the workload could be shared when hosting a Day of Service:

“I think [planning the Day of Service] helped our region in that it brought us closer together and we had to strategize on how to maximize our resources so that we can have the greatest amount of impact that we could have. . .” – Local Administrator 5, Site A

**University Faculty-led Workshops**

In addition to the Day of Service during the school year, STEP activities were slated to run on Saturdays afterschool and during the summer. These activities included workshops on Saturdays that were run by faculty from Site A’s sponsoring university. Site A’s grant proposal described the workshops as including “lab sciences, imaging science, computer science, math games, and GPS technology.”

The project-based workshops were designed to introduce STEP students to a variety of STEM career fields and college majors. One of the interviewees described the quality of the types of workshops offered to STEP students at Site A:

“We do a lot on our campus. . .One of the professors who just started working with our program, he's doing work in nanobiological technology. That's a field that most students wouldn't even know existed. And there are a lot of jobs in that area. We're a very big center for healthcare . . .There are opportunities all along different lines of jobs that people can hold in a healthcare capacity. And most of our students are unaware of some of those.”

“We try to open their minds to that so that they know more than just ‘doctor,’ ‘nurse’. . .So they hear about the laboratory types of positions. They hear about the research types of positions. All things that they could go to school for, get out of college and actually get a job because we have a high unemployment rate here. So, a lot of our students are reluctant to look at schools because they know their families do not have a lot of money. So the idea of taking on the $10,000 a year loan after all their scholarships is overwhelming to them. We want to assure them that the kinds of positions that they're going to be training for are going to give them a return where they will be able to pay that off and still be successful and prosperous in their future. So I think that's one of our big
strides in opening up our whole world of STEM professions to students.” – Local Administrator 4, Site A

Site A’s staff emphasized their ability to provide youth with timely STEM career information. This is information Site A administrators believed students would not have received otherwise and needed to learn about in order to meet their STEM career goals. The value of this information to students who underperform based on achievement gap data is discussed in Chapter 2.

Findings and Analysis for Research Question 4: SITE A

4. What are the overall strengths and weaknesses of the program in terms of the fundamental program design?

STEP’s Eligibility Requirements

The program’s eligibility policy was described as both a strength and a weakness by local STEP administrators. One administrator described the ability of students who are not part of a historically underrepresented minority in the STEM fields – but are economically disadvantaged – to become STEP participants as good practice. This was the administrator’s view despite the original intent of the program to increase access for Blacks, Hispanics and Native Americans (NYSED 1984, 3):

“Personally speaking, take for instance the policies regarding recruitment. I think [they are] great for the simple fact that it doesn’t exclude Caucasians or any other group completely. It is geared toward raising the diversity of underrepresented students in STEM fields. However, if you look at our society you have some Caucasians and Asians that are going through some economically difficult times [too]. And to exclude them completely, me personally, I don’t think it’s a fair thing to do.” – Local Administrator 3, Site A
With economic disadvantage being the only eligibility requirement for STEP students of any race, larger numbers of youth who were not from the three underrepresented ethnic minorities targeted in the original program design may become STEP participants. Based on data cited on NYSED’s website 6%, or 546 out of the 8,505 STEP students served in program year 2010-2011, participated in the program due to economic disadvantage (NYSED 2012b).

If more staff members recruit youth who are economically disadvantaged versus underrepresented ethnic minorities, the ethnicity of STEP students could change to include greater numbers of students who are not of African-American, Hispanic/Latino or American Indian/Alaskan Native descent. If recruiting youth from any race were to become a focal initiative, this practice would be a departure from the original program design that focuses on increasing minority access to STEM professions.

Another Site A administrator expressed concerns that the eligibility criteria are not inclusive enough:

“I would change the income requirements to be more [accommodating] to the middle class. I just believe that we missed out on a lot of students that come from a single [income] household or even a dual [income] household where . . .they don’t get free and reduced lunch but they’re still living paycheck to paycheck. I feel like there is still a disconnect really on what the poverty level is in America. I really believe all of the kids should be able to take advantage. But I would really like to see that income rate change to. . .whatever the state median is.” – Local Administrator 2, Site A

These responses demonstrate a desire by the administrative staff to assist any young person with an interest to explore the STEM fields. This desire may make it easier for Site A’s staff to allot program resources for initiatives like the Day of Service that reach out to students who may not be eligible for STEP participation. Site A’s staff was not as concerned about whether Day of Service activities led to increased enrollment of
STEP youth as they were about serving the entire school community. Serving youth who may not be on the STEP rosters but are part of the school community appeared to be a guiding principle for these administrators.

**Student Recruitment: Self-Identification**

Students who identify themselves as a member of one of the historically underrepresented ethnic minorities in STEM fields did not have to substantiate their ethnicity or economic standing. This may be considered a programmatic strength in that less paperwork is required to register these youth for the program. In the STEP Field Manual it stated that, “Documentation confirming economically disadvantaged status is required only for students who are not African-American, Hispanic/Latino or American Indian/Alaskan Native. The racial/ethnic identification indicated by students on the STEP application is acceptable documentation” (NYSED 2012c, 5).

Site A’s staff worked closely with middle and high school personnel to identify potential youth. Based on the interview data, Site A’s policies and practices regarding recruiting students into STEP at times led to sensitive conversations regarding how youth viewed themselves ethnically. One Site A administrator discussed how STEP’s self-disclosure policy regarding racial/ethnic identification (NYSED 2012c) led to recruitment challenges:

“We have a lot of students who are [ethnically] mixed. African-American and White. . .I’m meeting students who clearly [are Black] and that’s my assumption. And when I see who was at home and who’s head of the household that’s who they kind of identify with. And a lot of them are White mothers with Black fathers. And they’re divorced. And I see them checking, ‘White.’ And then when I go to meet the student I’m going, ‘You filled out this application. Can I ask what your background is?’ You can’t check both. So there is a box now for ‘Biracial.’ I’m noticing that a lot. . .are using that. . .‘Who you identify yourself as is who you are. You know who you are.’ So I tell parents that you checked this, but. . .your income isn’t lining up. ‘If this is really something you want for your child and they are Biracial you would need to check this
box. But realize that this is a piece of paper. This is what the State needs. This is not who I am saying you are.’ So getting them to understand that…” – Local Administrator 2, Site A

The original policy design was intended to increase the number of historically underrepresented ethnic minorities in STEM fields, including students who identified themselves as Black or African-American. Based on the interview data, the trend noted above resulted in a change in the 2011-2015 STEP proposal application. Prior to the 2011-2015 proposal application the biracial category did not appear. This change demonstrates a willingness by NYSED staff to collect information about STEP students’ ethnic backgrounds more accurately.

There is no mention of biracial identification in the Regents’ Action Paper or the STEP legislation (NYSED 1984; New York State Senate 1985a). Definitions for ethnic categories appear solely in the appendix of the Regents’ Action Paper. (See Table 4.14 for the definitions.) Throughout the STEP legislation, references are made to “minorities” and “minority group students.”

This may have been the case because the authors of the Regents’ Action Paper and STEP legislation were not concerned with whether STEP youth had one or two parents from an historically underrepresented ethnic group (NYSED 1984; New York State Senate 1985a). Students with at least one African-American parent, whether or not the students phenotypically appear to be African-American, would satisfy STEP’s original policy design to increase ethnic minority access in the STEM fields.
Table 4.14. Definitions of Ethnic Categories (NYSED 1984, 18)

<table>
<thead>
<tr>
<th>Ethnic Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black, Non-Hispanic</td>
<td>A person having origins in any of the Black racial groups of Africa</td>
</tr>
<tr>
<td>Hispanic</td>
<td>A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race</td>
</tr>
<tr>
<td>White, Non-Hispanic</td>
<td>A person having origins in any of the original peoples of Europe, North Africa or in the Middle East</td>
</tr>
<tr>
<td>Other Minorities</td>
<td>a) Asian or Pacific Islander; a person having origins in any of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands</td>
</tr>
<tr>
<td></td>
<td>b) American Indian or Alaska Native; a person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition</td>
</tr>
</tbody>
</table>

Students’ Academic Preparedness

In an effort to strengthen STEP’s design to increase the academic aptitude of its youth participants, Site A established a prerequisite GPA for students:

“When you talk about a 3.0 GPA it’s hard. . .They might come in at 3.0. Then you look at their next report card and all of a sudden [it’s lower]. But I’m not kicking anybody out at this point. They get a warning. ‘You got to bring that up.’ Because we realize it might not be doable we have a probationary GPA of 2.5. But the goal is 3.0.” – Local Administrator 1, Site A

“There was not as far as I knew a certain [NYSED-mandated] GPA. [The average GPA] was more like 2.0. Just get the kids in and get them exposed. Help them get to where they need to be. Now with the [2011-2015] grant. . .students need to be a 3.0 student. . .If they are not a 3.0 [student] and they’re trying to get into a STEM discipline they’re not being accepted into a college as a STEM [major]. They may be able to go in ‘undecided,’ or something and pull up those grades. Because they’re not ready for that type of academic rigor that they would be taking on in college. . .”

“For our program that was big. . .Because some of them were at a 2.8 or 2.7. So we made the decision that we would take students in, enrolled at a 2.5 – a high C, B average—under ‘probationary.’ If they fluctuated between the 2.5 and 2.8 [GPA] and then they would maybe get a 3.0 during the year, then they would stay. If they went under that 2.5 during a semester and then did not get themselves back up within that year then we would have to talk with them about letting them go out of the program. And we’ve had to do that.” – Local Administrator 2, Site A
Concern was also expressed about whether GPAs are a reliable measure of student ability:

“[In] the city school district. . .the quality of their education is really not great. So you could have really smart kids and these teachers are trying to just get the kids from here to here. . .Even if these kids have the potential, they’re not challenged enough. . .I’m assuming it’s pretty much the same in many of the urban areas. . . Not for lack of trying on the teachers’ part. But I just. . .What I see, sort of on the outside looking in, the kids who are really struggling, well, there is some help for them. The kids who really have the potential, who really could do well, they’re not challenged. So yeah, they’re getting all As, because yeah, they’re the best in their class but what are you preparing them against? That’s a whole other paper.” – Local Administrator 1, Site A

**College Readiness**

Another interviewee described how internal staff have raised concerns in the past about how STEP could be structured to make a greater impact on the college readiness of its students:

“I think we were too relaxed and STEP [NYSED] was a little bit relaxed in sharing that students were prepared for college. . . [So we] get these huge numbers of . . . students coming in from high school and they couldn’t even do ninth grade algebra. And I would say, ‘You know, okay so, the schools are failing our kids. But what is STEP doing? So I was always having that argument. . .I think maybe I wasn’t the only one. . . But one of the changes I see is the State is holding our STEP programs a little bit more [accountable]. So if you’re saying that you were graduating X amount of students, we want to know at what level. And if they’re not at college level tell us why. What are your observations? Is it beyond us? Because we can’t do these reports that we’re graduating all of these students, but our STEM numbers are still down. . .Something has to trigger these conversations. And let’s be real with the conversations. . .That’s a change.” – Local Administrator 5, Site A

One Site A administrator discussed a shift that took place around 2007 to focus efforts on supporting college readiness rather than academics. The shift was the result of research done by Site A’s sponsoring post-secondary institution on programs that are similar to STEP. (Examples of these types of programs are discussed in Chapter 1.)
Based on this research, Site A’s staff realized that the transcripts and subsequent résumés of many high school graduates were deceptive.

Students were graduating from high school with grades that were exemplary, but not reflective of student mastery of the academic rigor expected in college. In 2008, to address this concern, Site A’s staff gave their STEP students a community college placement exam to assess their college readiness. Site A’s staff also modified the content of their college readiness workshops for STEP students:

“Some of the statistics that have come out of our community college is that most students from the city who come there end up taking a minimum of 2 to 3 remedial or developmental courses before they’re actually ready to start the college level work. So students . . . are spending tuition dollars to basically take high school level courses. And so we felt that we could . . . bump up our services to help [students] start thinking about what level of skills they need. . . especially to be able to function well in a college environment.” – Local Administrator 4, Site A

Site A’s staff worked side by side with their school district partners to expose STEP students to college-level work that would enable the youth to gain admission to and graduate from the college of their choice.

**Findings and Analysis for Research Question 5: SITE A**

5. **What are the overall strengths and weaknesses of the program in terms of how the program has been implemented?**

**STEP Offices Located within the High Schools**

Site A was one of two sites in this study that had STEP offices located within the secondary schools of their partnering school districts. Two of Site A’s interviewees remarked about the advantage of having offices located within the high schools where they recruited STEP students:
“...They give us office space...You know, we can hold afterschool meetings or whatever. And really, I’ve been doing this long enough that I think that the presence in the school is really important. The way the world of the school is, if you’re out of sight they forget about you. So I’m really glad that we have a school-based program.” – Local Administrator 1, Site A

Another Site A administrator talked about the convenience of having an office on school grounds. This allowed the administrator to readily gauge STEP students’ class attendance instead of having to wait for secondary information from report cards. If STEP students did not seem to be spending the time they should in classes, Site A administrators had daily access to them:

“I'm also in their [STEP students’] building. So the ones who were showing up for my tutoring, the ones who were checking in with me I know they are staying active with their teachers. Versus the ones that I see walking down the hallway all the time. ‘That GPA isn't where it ought to...’ ‘Awe Miss, I'm getting it.’ ‘No, I've seen you in this hall.’...” – Local Administrator 2, Site A

**Program Staffing and Flexibility**

The number of staff that was designated to run Site A’s STEP was also a strength. Site A’s 2011-2015 STEP grant proposal cited five core staff who were directly involved in administrative oversight of the program. Site A was one of two sites in this study that had at least five core staff dedicated to STEP program oversight. Additional or auxiliary staff included teachers, college faculty members, and college students who worked on a per diem basis to implement the program. Of the cadre of staff, there were three administrators who shaped the daily implementation of the program. These three administrators made programmatic changes within the framework that NYSED provided in order to fulfill STEP’s requirements and priorities.
Site A engaged in a fluid decision-making process when implementing STEP’s program design. This administrative fluidity allowed Site A’s staff to satisfactorily respond to implementation needs. One administrator indicated that state officials “…give you a lot of leeway. They tell you how much money you have. They tell you the students you are supposed to be serving, and they tell you that your activities need to be related to STEM education. And then they leave it up to you to create a program.”

This administrator also described Site A’s typical process for making decisions about program implementation:

“So myself, my staff, and my boss we get together to build our curriculum for the year. And we’ve got . . .our calendar of events for the year. . .So we come up with this and we’ve been working with the same activities pretty much for the last few years. But then you tweak it every May before you submit it again. So you go through and you say, ‘What worked? What didn’t work? Was the timing off on this? You better add some things in. . .So you’re changing all the time because you’ve got new information that you want to share. You’ve got some new initiatives you want to implement. Maybe one year we focus on something and the next year you want to focus on something else. . .So it evolves. It just keeps evolving.” – Local Administrator 1, Site A

Although STEP’s guidelines were outlined in the legislation and NYSED’s grant proposal, Site A’s staff did not describe this prescribed framework as a barrier. Instead, the comments shared by administrators demonstrated a reliance on the proposal requirements and priorities to help Site A as it shaped the program.

**Student Retainment**

Although NYSED had a “Biracial” category for capturing the ethnic background of its students, finding ethnic minorities who are historically underrepresented in STEM careers had been difficult for Site A (NYSED 2012a). In both STEP’s Field Manual and Operations Manual, STEP sites were directed to partner with school districts that have an enrollment of at least 20% African-American, Hispanic and Native-American students
When sites partner with school districts that barely meet the 20% minimum, like Site A, this impacts the staff’s ability to retain STEP students:

“The biggest challenge probably is getting student participation. . .There is a minimum of six different outreach programs that do some form of similar activities as our program. . .They are totally different but there are some things that we have in common. We collaborate. . .So you’ll find students in dual or multiple programs. Which I don’t have a problem with because. . .it’s all about how a student utilizes his or her time. Sports is probably the biggest barrier to what we try to accomplish when we talk in terms of participation. Because you know kids have sports [throughout] the year. . .They have to be able to balance sports and academic programs or opportunities also.” – Local Administrator 3, Site A

**STEP’s Male, Latino, and Native American Participation**

Site A was also working to increase the participation of historically underrepresented males in STEM fields. This goal was captured in Priority 1 of the 2011-2015 grant proposal. Two of the five respondents emphasized or acknowledged the existence of a plan to address Priority 1:

“We are trying to increase the number of males who are involved in the program. It’s challenging because of sports and other outside factors. It's challenging to enlighten and change their mindset.” – Local Administrator 3, Site A

“What we are doing is, in our area we've had charter schools open up that are working with males. And so we're partnering directly with them to see how we can help those males . . .” – Local Administrator 5, Site A

Priority 2 in the 2011-2015 grant proposal encouraged STEP sites to implement programming to improve the recruitment and retention of youth who are of Latino/Hispanic and Native-American descent. Site A was also beginning to address this priority area:

“This particular round of STEP is looking at engaging more Latino students. With some of our activities in our program we have started a Latino club for students in
all of our [schools]. We are actively working with using Latino mentors from various parts of the population to help with that initiative.” – Local Administrator 4, Site A

The State Budget and Summer Programming

Site A described plans in its grant proposal to operate STEP activities during the summer. However, Site A has not been able to operate a summer program since 2010. NYSED’s transition from approving STEP grants to STEP contracts was identified as being the catalyst for the delay in summer funding:

“[Since 2010] funding tends not to come in time for us to do what we need to do. . . [I]n that last grant cycle [2006-2010] for whatever reason money was coming in earlier from the grant so we could plan for the summer…[So we] were doing a four-week program for our students over the summer.” – Local Administrator 2, Site A

Another interviewee provided greater detail about the change in the funding process being due to how STEP funds are processed. In 2010, NYSED switched from requiring STEP grants to contracts. This added additional time to the approval process and release of funds for STEP sites. This new process has also added an additional economic burden on Site A’s sponsoring post-secondary institution. Based on a letter of approval from NYSED, the institution has moved monies from other post-secondary initiatives in order to fund the salaries of Site A’s staff:

“We haven’t been able to do a summer program [since 2010] because we never have a contract in time. . .We don’t have any money. So I would like it to be a year-round program. I want to say it is, but in reality, if you don’t have any money you can’t do anything. . .So based on that letter of approval they will continue to pay our salaries. But they [our college] won’t let us expend any other funds until the contract comes through. . .They’re not just going to let you spend all of that money, especially with [New York’s] State budget, and find out that, ‘Oh well, we cut the funding for STEP. . .’ I don’t think that would ever happen, but [our college is] very conscious. We’re lucky that they’ll continue to pay our salaries. . .I would like to say it’s not going to happen this year, but I have no reason to believe we’ll get our money any sooner this summer.” – Local Administrator 1, Site A
Despite concerns regarding sustained funding raised by each interviewee, all expressed a determination to continue to support as many STEP activities as possible.

Findings and Analysis for Research Question 6: SITE A

6. What are the implications of the research findings for future research and policymaking regarding career development programs focused on recruiting and preparing youth for STEM occupations?

Program Sustainability

Having a stable budget enables staff to effectively plan for activities during the summer as well as throughout the program year. Waiting on the Legislature to approve the STEP budget and for the State to release STEP funding from year to year impacts students, staff, and community partners:

“I would say the biggest [challenge] is because we are working with the State and if the money doesn’t come through it makes it harder for us to follow through on some of things that we put in our grant. Take for instance this year [2012], we were awarded a certain amount of money that they pulled away from us. Our grant cycle ends June 30. Today is June 8. We do not have that [money] yet and we’re expected to spend it . . .So we have to flip-flop things around . . .I would definitely change the funding stream as far as when the income comes in so we can have a seamless year with our planning.” – Local Administrator 1, Site A

Another administrator commented on the typically slow process of receiving approved funding from state governments: “It’s just that if you are doing any financial dealings with New York State or the government it’s a process. It’s never on time.” To address the uncertainty of summer funding, Site A partnered with local school districts and community-based organizations. School districts sponsored STEP activities for the summer.
Site A’s staff also ran summer programs for other organizations. The STEP youth who were eligible for these programs participated in summer activities by joining the other community-based programs for the summer. While these summer partnerships were helpful, Site A’s staff indicated that they preferred to offer STEP activities throughout the entire year without having to second-guess whether the contract-approval process would bear financial fruit in time:

“[I wish] that the process at the State would run smoother . . . We have different things that are backing up against deadlines. For example, we’re currently waiting for approval on the budget and the extra funds we got this year, plus a budget modification. And our final report is due. Now your final report should be the numbers that exist after all those things get accomplished. If you haven’t received confirmation on say, budget modifications, then it’s very difficult to do a final report – you’ll move money around. . . I’m not offering to go to Albany to run it . . . But I just think there could be a more efficient way of getting various documents through the process in a more timely manner. . . to be able to move forward with our programming in the manner that we wrote it.” – Local Administrator 4, Site A

Throughout the Site A interviews, some of the more passionate responses were given when interviewees talked about STEP’s future viability. Site A addressed the concern by partnering with community-based organizations to provide as many STEP activities as possible until the funding is released.

**Advocacy and Coordination**

Site A’s administrators stressed the importance of actively engaging adults who work with STEP youth to provide adequate student support:

“There are all kinds of programs, but no one’s making sure everything’s being taken full advantage of. It’s not enough to offer space. You have to take ownership of whose job it is to say what it is STEP should be doing. [So] everyone finds out about it. Kids are kids no matter where you are, in an urban or suburban school. If there isn’t someone saying you’re really good at this or think about this or talk to this person. . . I think it does happen more at suburban schools, people reaching out. . .” – Local Administrator 1, Site A
“Our strength comes through strong partnerships and collaboration with those who [are] in power to make decisions like your administrators, your assistant administrators, school building administrators on down to guidance counselors.” – Local Administrator 2, Site A

“There’s a lot of change [in school districts]. And when you have change you have to go back and readjust your program. Sometimes it’s an all brand-new administration because one of the requirements for a school that’s being cited for chronically poor performance is that they can close the school for good. They can reengineer the school where they change the principal and half the staff. So as you might imagine there is a lack of consistency in the schools themselves. So when you’re trying to integrate your program into the school, it changes all of the time.” – Local Administrator 4, Site A

The location of Site A’s STEP offices within the secondary schools better enabled STEP staff to be aware of district changes that may have impacted STEP. This close proximity of STEP and school staff also enabled planning adjustments to be made more quickly than if the STEP staff worked solely on its university’s campus.

CASE STUDY TWO

Findings and Analysis for Research Question 3: SITE B

3. To what extent does implementation of the program by the program sites align with the program as designed at the state level? a. If there are differences between the program as designed and the program as implemented by the program sites, what are the reasons for these differences?
Alignment of Local-level Implementation and Program Design

Like Site A, Site B was located in upstate New York. However, Site B was publicly funded and had been in operation twice as long as Site A. Site B was initially funded in 1986 when STEP began. Between 100 – 200 students participated in Site B’s STEP, a smaller number of students than Site A served.

School administrators whose students were a part of STEP identified teachers or counselors to coordinate student participation and act as district liaisons. Unlike the other three study sites, Site B’s administrative staff had little or no involvement in the selection of the STEP staff who worked directly with the STEP students. Although one can expect the school administration to choose appropriate staff to manage STEP at their schools, STEP staff on the university’s campus missed an opportunity to connect and build relationships with key stakeholders (Coleman 1988; Sergiovanni 1992).

However, given the small number of staff dedicated to the project, it would be challenging to change the working relationship between the secondary school and university STEP staff. Two of the four Site B people interviewed for this study played a senior administrative role in the operation of STEP. Only one worked on the project full time. This staff member was also a university faculty member with substantive demands outside of STEP. See Table 4.15 for additional background information on Site B.
Table 4.15. Background of Site B – Program Year 2011-2012

<table>
<thead>
<tr>
<th>Type and Location</th>
<th>Public Post-Secondary Institution, Upstate New York; Administrative STEP Offices Solely on University Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Youth Served</td>
<td>100 – 200</td>
</tr>
<tr>
<td>Participating Youth in STEP Student Research Conference</td>
<td>Yes (5-10 youth)</td>
</tr>
<tr>
<td>Reported Impact of Day of Service Activities</td>
<td>Not specified</td>
</tr>
</tbody>
</table>

The following section outlines some of the core program activities conducted by Site B’s staff: (1) Student Workshops, (2) the Parental Component, and (3) Day of Service Activities.

**Student Workshops**

Once a month, students were bused in from their schools to Site B’s post-secondary campus in order to participate in STEP activities. This was the main activity for Site B’s STEP youth. Some of the students, depending on what their schools coordinated, had an afterschool activity and traveled to Site B every day. These activities occurred during the academic year and consisted of classes or workshops that had morning and afternoon sessions. Doctors and other medical professionals shared their expertise and encouragement:

“We have a keynote speaker. . .And typically we will try to get people who have underrepresented backgrounds [to instruct] so that the students are seeing someone like them who has succeeded. . .Each group will get two different lessons, whether it be science lab or math tutoring or SAT prep.” – Local Administrator 1, Site B

In 2008, Site B enhanced their college preparation activities by offering students information about which high school classes are the best for them to take given their
STEM career goals. At that time, Site B also started to include experts in the collegiate financial aid field as workshop speakers.

One Site B administrator described how the program started to offer more intensive college preparation activities as a result of the speakers they hired. Without being directed to do so by Site B’s staff, these speakers focused on college preparation in their presentations. They engaged students in discussions about high school classes they would need in order to be able to take required Regents exams to earn their diplomas.

Students also received information about managing their financial plans:

“The kids really are better prepared to navigate through high school than their counterparts when they come to STEP. [Students learn] tricks on how to save money for college. The financial aid [process]. One woman was fantastic teaching them how to budget. . .If the kids don’t like the [instructor] we find somebody else because it’s their program. They’re giving up their [day]. They’re getting up early. They’re getting on a bus. They’re. . . spending the whole day here. . . It needs to be fun if we’re going to get them to come back. So we try to get the [instructors] to do a lot of hands-on stuff.” – Local Administrator 1, Site B

**Parental Component**

As discussed earlier in this chapter, Site A has struggled with involving parents in STEP activities. Encouraging parental involvement has also been a challenge for the staff at Site B. Reportedly, a lot of Site B’s STEP parents worked outside of the home, including on weekends.

Site B went a step farther than Site A in trying to encourage parents’ participation. Site B instituted a policy that described parents’ participation as mandatory. As part of the requirements for students’ participation, the site’s parents were required to attend at least one STEP workshop with their children. Even though Site B had this policy the number of parents who participated was minimal:
“The thing that we changed on our registration form is that we now tell parents, in bold, ‘It is your responsibility – in order for your child to participate – you must come to at least one STEP [workshop]. Please choose the date that you will come.’ The first year I did that... only [15%] showed up... Then last year we probably had about [20% of the parents] come. So it’s getting better. And we have some parents who come once and then decide, ‘Okay. I like this.’ They keep coming back...” – Local Administrator 1, Site B

Parents were also invited to attend advisory meetings. These meetings were not well attended either. Instead of regularly meeting face to face, parents at Site B were contacted through phone and e-mail contact:

“They [NYSED] want us to have parental involvement. We have to report on that. We have to have a [parent] advisory board. Which we do. It’s not very large, but that’s part of the area that we’ve been working on for a long, really long time... getting more parents involved... I’m willing to go meet with them [parents] in the evenings if that’s what they need. There’s a lot of e-mail contact between myself and parents. I think [our approach] is more personalized. We’re on a first name basis. Some of them have my cell phone numbers. Some of them have my home number... I talk to parents at home at night if that is what I have to do to talk to them. I don’t know if other programs do that. It doesn’t say in our guidelines that we need to be available... at all times. But I am.” – Local Administrator 1, Site B

There was little to no evidence of Site B having a traditional parent-advisory board marked by parental collaboration with STEP staff regarding programming. In addition to the e-mail and phone contact, Site B staff connected with parents who attended Saturday workshops while their children participated in STEP classes. During the Saturday workshops, parents were able to gather information that was tailored to their needs as caregivers. Parents discussed issues that could impact the successful completion of their children’s graduation from high school. They talked about how student report cards reflected the type of math and/or science tutoring that may be needed for the STEP students.
During the Saturday workshops, parents also learned tips for better preparing their children for college. For example, there were workshops for parents to learn about the financial aid process for college. Line by line, parents were instructed on how to complete the Free Application for Federal Student Aid (commonly referred to as FAFSA) forms. Completing the FAFSA forms can provoke anxiety for parents who must document personal information about their assets, child support payments, and receipt of food stamps in order to receive this federal assistance (United States Department of Education 2012).

Site B was unique from the other three study sites in that its STEP grant proposal described a coordination role for parents during the activities of the Saturday sessions. Parents monitored students’ classes and provided feedback to program staff. One Site B administrator worked side by side with two parents and found this method of connecting with parents more substantive than focusing on growing an advisory board:

“And I couldn’t do it without them [the two parents]. I mean they help me so much . . . rather than having a board of people telling me what to do, I’ve got two women hands-on. . .” – Local Administrator 1, Site B

In order to substantively address parents’ needs, parental participation in program assessment and planning is essential (Mooney and Davoren 1999; Henderson et al. 2007; Perkins 2009); see Appendix G. However substantive the interaction may be with the parent assistants, Site B’s administrative staff only worked with two parents during a program year. Getting feedback from this small number may not be reflective of the viewpoints of the larger group of parents.

Although it is not uncommon for organizations to have a small number of representatives speak for the larger group – assemblypersons and senators are elected for
that purpose – what differs here is the selection process for parents. Based on the
interview data, the two parents that assisted with coordinating the Saturday program were
chosen solely by the Site B administration. All of Site B’s parents did not have an
opportunity to participate in the selection process.

One of Site B’s parent assistants was interviewed for this study. When asked
about parental participation in STEP she mentioned an end-of-year session. All of the
STEP initiatives – including program administrators and parents – met during this
occasion. Although the session was considered a special one, a small number of parents
attended the event:

“It’s nice when the parents come out. And unfortunately that is a struggle with all
programs that I see that involve kids. . .If your priorities are not straight, your work
schedule – it’s the single mom thing. It’s the single dad thing. . . You know I used to
think that if you feed the parents they’d get involved. But feeding the parents is not
really working any more. I don’t know what the dynamic is. I don’t know if it’s the
younger parents. I don’t know if it’s broken homes. Honey, if I could find that formula I
would be the richest woman in the world.” – Parent Assistant to the Administrators, Site
B

**Day of Service Activities**

Frustration with the scope of work involved in coordinating Day of Service
activities did not surface during the research interviews with Site B’s staff as it did when
collecting interview data from Site A. However, one of Site B’s administrators expressed
frustration with having to explain the merits of STEP to a general audience. This
administrator questioned the appropriateness of sharing STEP recruitment information
with ineligible students. When parents found out that their children were not eligible due
to the racial and economic criteria some became disgruntled:

“[The] Day of Service. . . poses an issue for us because . . . I have parents of
students who are not eligible – mostly White parents who were not economically
disadvantaged saying, ‘Why can’t my student come?’ I’ve gotten yelled at by parents. I had a parent tell me that if his [child] couldn’t come to STEP, then no students would come to STEP. He would see to it that there would be no more STEP.

[So] I keep a list of opportunities that are for all students. And when I get an angry parent I tell them, ‘I’ll be happy to send you this list of opportunities, programs that . . . your child may be eligible for.’ . . .”

This administrator continued to share reasons why the Day of Service activities did not benefit Site B:

“[NYSED] really wants us . . . to promote the STEM fields, which is a good thing. . . But for us it’s not really bringing more kids to STEP. And I don’t think that was their objective either. But it’s kind of glaringly putting out there that, ‘Nope, your child can’t come to that. Only these students can come to this.’ So I don’t know if necessarily that’s a good thing. I’m finding that it causes more friction than good. My enrollment’s not going up. People are not going, ‘Oh, there is the STEP program.’ They’re going, ‘Hey, why can’t my kid go to that?’” – Local Administrator 1, Site B

Another Site B administrator only shared positive aspects of the Day of Service activities:

“I think one of the very good initiatives from the State’s [NYSED’s] perspective has to do with the Day of Service. . . I think that it is a very good initiative to impress on students how important it is to engage in mathematics, science, technology activities during their school year.” – Local Administrator 2, Site B

The difference in perspectives of the administrators may have been due to the roles each one played. The administrator who expressed frustration with the Day of Service activities was directly responsible for implementing them. While the administrator who shared only positive comments about the Day of Service activities was not responsible for implementing this part of the program. So the latter perspective reflected more of a distant view.
Findings and Analysis for Research Question 4: SITE B

4. What are the overall strengths and weaknesses of the program in terms of the fundamental program design?

**STEP’s Eligibility Requirements**

Site B’s administrative staff did not view STEP’s eligibility requirements as a barrier to meeting NYSED expectations. Unlike Site A, Site B’s staff spoke about having little trouble recruiting students. In fact, Site B’s staff have had to turn students away:

“We have to operate within the bounds of what funding is available. So as much as we want to be involved more we have to restrict it to us being able to serve those we can really afford to serve given the amount of funding that we have.” – Local Administrator 2, Site B

Site B’s staff was also sensitive to how economic disadvantage as an eligibility requirement can impact students’ self-esteem. As a result, care was taken in how Site B’s staff marketed the program to eligible students:

“All of the students who could participate may not necessarily want to participate because they don’t want to see themselves as counted among those who are economically disadvantaged or don’t want to go by the school lunch kind of thing. That’s very personal, private information.” – Local Administrator 2, Site B

The concern of Site B’s staff with its students having a social environment that increases their self-images is consistent with the original program design. The Regents’ Action Paper and STEP legislation include the program’s goal to reduce the impact of social conditions or economic disadvantage that some STEP students have (NYSED 1984; New York State Senate 1985a). The type of respectful, social environment one Site B administrator described encourages students to reach their academic potential
(Markus and Nurius 1986; Lee and Oyserman 2009). How student success is tied to youth having well-developed self-concepts is discussed in Chapter 2.

**Students’ Academic Preparedness**

Both Site A and Site B interviewees spoke about increasing their academic expectations for their STEP students. In fact, Site B’s staff reported a 100% high school graduation rate for their STEP students. The 100% graduation rate may be attributed to the approach Site B’s staff took to encourage students to attend tutoring classes. It was not optional for Site B’s students to forgo participation in tutoring sessions if their high school report cards showed failing grades. Based on their report cards, students were pulled into one-on-one meetings with the senior STEP administrator to discuss why he or she may be missing classes. Discussion topics for the individual, face to face student counseling meetings included finding out if there were circumstances in the home that might be alleviated to help students excel in school.

**College Readiness**

While Site A’s staff emphasized using a college-placement test as one of the program’s indicators of college readiness, Site B’s staff described the rigor of college-level projects students complete. During Site B’s weekly student sessions, STEP youth were engaged in completing projects that were supervised by university professors as well as graduate and undergraduate students. Site B collaborated with one of the sponsoring college’s science department. This collaboration was described as a “big shift” to having a designated faculty member supervise Site B’s STEP students once a week. As of 2011, the faculty member had been working with Site B’s STEP students throughout the academic year.
One of Site B’s administrators described how the graduate and undergraduate students who supervised the college-level science projects often mentored the STEP students: “It’s young [college] students working with high school students. And [the STEP students] think it’s the coolest thing to have a college student working with them.”

One of Site B’s administrators expressed a need for there to be greater acknowledgement of students who successfully complete STEP in the college admissions process. Students who excel in STEP should be able to forego some of the customary college admissions hurdles. This administrator asserted that STEP students have already been vetted to prove their college readiness, particularly to transition from their high school to the college campus of their STEP. What is needed is to make the college-school connections stronger:

“What I’m thinking of is creating paths to college through the various STEP programs. Not to say that it is not done now. . . I don’t want to use the word ‘guarantee’ placements for students who go through our program. ‘Guarantee’ is not the word that I want to use. . . Students. . . see this program as a way of, ‘Okay, if I get into this program and work hard enough it could well be my ticket to college here. . .’ It doesn’t necessarily happen because they have to go through the same vetting process that any student goes through.” – Local Administrator 2, Site B

This administrator would like to see incentives provided to colleges to admit STEP students. Scholarships could also be provided through STEP so students who successfully completed the program could attend with less economic hardship.

There is language in the Regents’ Action Paper and the STEP legislation that is consistent with this administrator’s assertion (NYSED 1984; New York State Senate 1985a). The Regents’ Action Paper supports flexible admissions requirements for ethnic minorities:
“[I]t will be necessary for institutions to make special efforts and take greater advantage of the existing pool of minority students. There must be provisions for flexibility in admissions requirements, alternative educational programs, appropriate resources, and services to enhance minority students’ choices of gaining entry to and successfully completing professional education programs” (NYSED 1984, x).

In fact, the Regents’ Action Paper made repeated references to career pipeline problems that have been worsened by “inflexible or insensitive admissions procedures and professional programs” and a “lack of institutional commitment to affirmative action” (NYSED 1984, 4). (See Table 4.2 for a complete listing of policy assumptions made in the Regents’ Action Paper regarding a lack of access to STEM careers.)

Another flexible admissions strategy for action described in the Regents’ Action Paper is to increase the number of ethnic minority faculty and administrators at the university level:

“Graduate and professional schools should develop and implement affirmative action policies and programs to recruit, hire, and promote minority faculty and administrators. The affirmative action program should also provide on-going activities to orient and sensitize administrators and faculty to the special needs of minority students” (NYSED 1984, 14).

Committing to the implementation of flexible procedures was espoused as a short-term effort in the Regents’ Action Paper. Twenty-five years later, my interview with the Site B STEP administrator who raised the issue demonstrates that consideration of the “flexible admissions” strategy continues. In this instance, it was on behalf of students who have excelled in STEP.

There is also support for flexible admissions strategies in the STEP legislation. In the Regents’ Action Paper, the Commissioner of Education is granted authority to “conduct, encourage and assist throughout the state, research and studies relating to equal
opportunity and affirmative action in the licensed professions” (New York State Senate 1985a).

Data gathered for a study of doctorate recipients in the United States by the National Science Foundation (NSF) (2012) indicate that underrepresentation of the ethnic minorities targeted for support by STEP continues to be an issue.

In 2011, there were 15,910 doctorates awarded for Life Sciences, Physical Sciences, and Engineering degrees in the United States. Of the science degrees, less than 1% or an average of 0.267% were awarded to American Indian/Alaskan Native graduates. Respectively, Black/African-American and Hispanic/Latino graduates on average were awarded 4.233% and 5.433% of these degrees; Asian and White graduates received an average of 12.8% and 73% of the science degrees. (See Table 4.16 and Appendix F for additional data regarding doctorates awarded in 2011.)

These data indicate a continued need to examine policies that are in place – including flexible admissions initiatives – to support greater access of historically underrepresented ethnic minorities to STEM fields.

Table 4.16. All United States and Permanent Resident Doctorate Recipients in 2011 (NSF 2012)

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>All U.S. Citizen and Permanent Resident Doctorate Recipients (N= number)</th>
<th>N and Percent Distribution by Racial Group (x = average percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>American Indian/Asian</td>
<td>Asian</td>
</tr>
<tr>
<td></td>
<td>N  (x)</td>
<td>N  (x)</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>7,855</td>
<td>27</td>
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<tr>
<td>Physical Sciences</td>
<td>4,730</td>
<td>13</td>
</tr>
</tbody>
</table>
### Field of Study

| All U.S. Citizen and Permanent Resident Doctorate Recipients (N= number) | N and Percent Distribution by Racial Group (x = average percentage) |
|---|---|---|---|---|---|---|
| American Indian/Asian | Black/African American | Hispanic | White |
| N | (x) | N | (x) | N | (x) | N | (x) |
| Engineer-ing | 3,325 | 7 | 0.2 | 561 | 16.9 | 133 | 4.0 | 193 | 5.8 | 2,298 | 69.1 |
| TOTAL | 15,910 | 47 | 0.3 | 1,918 | 12.1 | 719 | 4.2 | 875 | 5.5 | 11,715 | 73.6 |

### Findings and Analysis for Research Question 5: SITE B

5. What are the overall strengths and weaknesses of the program in terms of how the program has been implemented?

#### Location of STEP Offices

Site B also differed from Site A in its working relationship with school district personnel. Those who oversaw STEP on the sponsoring university’s campus had limited interaction with the staff of its school district partners. Whereas Site A’s staff had offices located within the schools they served, Site B’s administrative staff conducted business solely on their university’s campus.

The physical distance between the offices of the school district staff who coordinated STEP activities and the offices of the STEP staff on the university’s campus could make it challenging to advocate for STEP funding. STEP is one of a number of other programs that compete for school funding. In order for a school to participate in Site B’s STEP, the school must dedicate monies to underwrite support for school-based advisors and transportation costs for students. If Site B’s administrative staff operated as
part of the school district’s campus, STEP may be viewed as a core part of school operations. Instead, Site B’s administrative staff has lost school support over the years:

“Another challenge has to do with what many schools are now experiencing in terms of their own budgets. And a part of the program is the cost share with the program. . . . We have lost districts because of the fact that they are no longer able to underwrite the transportation for the students.” – Local Administrator 2, Site B

In these cases, Site B called upon its parents to advocate on the program’s behalf with the school districts. Although Site B did not boast of a strong parental-advisory board, there had been success in organizing parents to reach out to school district personnel to highlight the need to continue STEP initiatives there.

**Program Staffing and Flexibility**

Similar to the feedback given by Site A, Site B’s staff described running its STEP by closely following NYSED’s guidelines. In contrast, Site B did not have one administrative staff person dedicated to solely overseeing STEP activities. Although Site B had one administrator who worked on STEP activities on a full-time basis, STEP at Site B was one of a number of initiatives this administrator oversaw.

Another Site B administrator described the challenges of managing so many programs:

“It does get done. It’s tricky. You have to keep very accurate records. I have to keep very extensive logs on my time and what I’m doing for which grant just so that it’s clear. And there will be some days when I work all day long on STEP. But then on other days I spend more time on the other grants. And that’s how we work it out with the directors. And they’re all pretty amicable that way. So it works. It works for us.” – Local Administrator 1, Site B

Another Site B administrator shared his suggestion to NYSED’s staff that the location of the student conference be alternated so sometimes the students and staff
would not have to travel to Albany where the conference has always been held. This administrator reasoned that if the student research conference was located closer to Site B or on its sponsoring university’s campus, there would be less of an economic and logistical burden on Site B’s small staff:

“From time to time the requests go out regarding what we’re doing and what [NYSED is] doing. Suggestions. They [NYSED] do provide those opportunities for that kind of feedback. But what I don’t know is how many of these get addressed. I think more could be done to actually consider some of the suggestions, simple though they may be. . . I don’t know if it is the State or just the regional groups. . . who are aware of the concerns. . . The State provides certain guidelines. But then in terms of the [student research] conference itself. . . there are [other] participants within the State agency [who may determine this.] There are some things that are not clear to me in terms of the actual procedures related to the conference.” – Local Administrator 2, Site B

This observation made by the Site B administrator draws attention to the bureaucratic structure of NYSED. There are a number of state-level administrators within NYSED that can influence STEP’s policy implementation. Because STEP was administered out of the Office of K-16 Initiatives and Access Programs (K-16 IAP) there may have been standard procedures for student research conferences for all K-16 IAP programs. (See Appendix I for the K-16 IAP organizational chart.) These procedures may include limiting the location of the student research conference to Albany. (See Chapter 2 for a discussion of standardized practices that are characteristic of bureaucratic structures.)

In addition to the K-16 IAP bureaucratic structure, the size of NYSED’s STEP office may impact attention to suggestions by STEP site administrators. As discussed earlier in this chapter, since STEP began in 1986 there has been a smaller number of NYSED staff dedicated to overseeing the program. This may have accounted for the lack of feedback to site administrators.
Although the regional representative structure was set up to counter the effects of less administrative oversight at the state level, when Site B’s administrators shared feedback with the regional representative for the area this was an exchange among peers. Site B’s regional representative served as a communicator as opposed to a manager:

“They [NYSED staff] look at us as being kind of the steering committee. . . That’s pretty much it. They would usually. . . give us information so that they don’t have to call every program or just put it in an e-mail. We can handle notifying all of our regional people. . .The updates, when they give it to us, we pass it on to the rest of the programs. That’s pretty much it.” – Local Administrator 3, Site B

When Site B’s staff shared suggested changes or concerns to the regional representative, expectations were low that action would be taken given the small number of NYSED staff.

**Student Retainment**

While Site A’s staff discussed challenges with retaining STEP students, Site B’s staff highlighted their efforts to avoid turning students away from the program:

“[E]ven though we work specifically with specific districts, we have reached out to other school districts that have interests in what we do. . . As a matter of fact, [a student from] one district which was never involved initially in our program. . . heard about the program and came to us. . . He just asked if he could participate in the program. And we sat down, discussed it and thought it through. We said, ‘Okay, here is somebody who is interested in what we’re doing. Yes, he’s not in one of our schools. [But] why deny the student the opportunity to participate?’ . . . And now that district is very much a part of the program.” – Local Administrator 2, Site B

The aforementioned student graduated from STEP and returned as a guest speaker for the weekly student workshops. This Site B administrator also described instances of other STEP students who graduated and returned as guest speakers. Sometimes STEP graduates would drive more than 100 miles to work with current STEP students.
STEP’s Male, Latino, and Native American Participation

Like Site A, Site B’s 2011-2015 STEP grant proposal described its site’s emerging ability to meet Priority 1 or the establishment of program services designed to improve recruitment and retention of historically underrepresented male participants in all targeted grade levels. Based on Site B’s grant proposal, the staff provided targeted services to underrepresented males at a “developing level.” Services targeted at the recruitment and retention of male STEP participants were provided in some but not all targeted grade levels. Some of the efforts provided by Site B’s staff to address Priority 1 included enlisting male STEP alumni and male C-STEP students as mentors.

The State Budget and Summer Programming

Site B’s 2011-2015 STEP proposal described a summer component of continued learning and research for the students. However, like Site A, Site B’s funding for the summer and academic year was not normally confirmed by the expected start date of the program year, July 1:

“Last year we did not find out that we had funding until sometime in late August, the beginning of September... So [we] didn’t work in the summer. Of course I did things that I knew had to be done for final reports and those kinds of things. Because you just don’t let that go. But we were working not knowing if we were going to get paid because we weren’t sure.” – Local Administrator 1, Site B

Another Site B administrator highlighted the importance of the summer component in keeping youth actively engaged in STEM activities, especially in the urban centers. Summer programming was so key that the administrator acknowledged the importance of finding alternate sources of funding:

“Why can’t we... provide activities directly within the school buildings or back on the university campus?... I think it’s dependent on us within our different STEP groups to do some of these things. And to get universities to buy in to the summer
experiences. But of course, the way things are economically right now shows that some
groups are not going to touch that with a 10-foot pole.” – Local Administrator 2, Site B

This administrator’s mindset is what was envisioned by one of the architects of
the STEP policy paper who was interviewed. Funding to support STEP was conceived as
an opportunity to plant seeds in educational institutions so that these institutions would
see the importance of such programming. The importance would become so significant,
that institutions would find ways to augment the “seed money” provided by NYSED.

Contrary to reportedly usual NYSED practice, Site B received confirmation
before program year 2012-2013 that it would receive funding. This may be an indication
of NYSED changes in expending STEP contract monies that will be sustained as STEP
continues.

Findings and Analysis for Research Question 6: SITE B

6. What are the implications of the research findings for future research and
   policymaking regarding career development programs focused on recruiting and
   preparing youth for STEM occupations?

Program Sustainability

One of the framers of the Regents’ Action Paper shared that the STEP initiative
was designed with the expectation that sponsoring post-secondary institutions would
assume more responsibility for implementing STEP:

“My vision was that [STEP] would be branched out into a broader venue so it
became a part of their [sponsoring post-secondary institutions] work to improve access
for underrepresented and underserved populations. Not all of that has happened because
they didn’t, in my judgment, integrate these programs in a way where they became
institutionalized as part of the work of the institutions.” – Former NYSED Administrator
A strategic step in this direction was taken by Site B’s staff. This step was one that was not discussed by interviewees from the other STEP sites. Since Site B was initially funded as a STEP site, Site B has allocated fewer STEP monies toward salary costs. An additional 20% of one Site B administrator’s salary is paid by the sponsoring post-secondary institution’s sources:

“When they cut the funds from the State . . . we still [served] our students. Salary [costs] take up a lot. And realizing that I could . . . save that salary money to use it for students, that’s what we did.” – Local Administrator 2, Site B

Advocacy and Coordination

The Regents’ Action Paper identified inadequate counseling at critical junctures of students’ academic careers as a component of why ethnic minority students have not achieved parity in the licensed professions. The significant impact of faulty career counseling is discussed in greater detail in Chapters 1 and 2.

Given the occurrence of faulty counseling, increasing student knowledge of educational requirements is one of the Regents’ strategies for action that are discussed at the beginning of this chapter. One of Site B’s administrators described how STEP students were taught how to communicate with high school counselors who may inadvertently make unsatisfactory class schedule recommendations. Site B’s STEP students were trained how to advocate for more academically rigorous class schedules than they may have originally been offered in high school:

“[This] really intense program [was] started with the ninth graders. . . . They were taught things like math classes they have to take in order to [take] the Regents exam. How many science classes. What order they should take them in. Giving our students enough knowledge so that when they went to their guidance counselors at the high school they could say, ‘No, I need to take bio now so that I’m ready for chem..’ . . . So that [the students] knew what it meant. So they just didn’t have someone who would say, ‘No, you can’t go into this class because there’s no time in your schedule and you won’t be
able to have lunch.’ We said, ‘So what. Pack a lunch and eat it in the hallway between classes. Get that bio class and see if you can graduate on time.’” – Local Administrator 1, Site B

Preparing students to advocate in this way was not discussed by the staff at Site A or by any other interviewees for Sites C and D.

CASE STUDY THREE

Data for Research Question 3: SITE C

3. To what extent does implementation of the program by the program sites align with the program as designed at the state level? a. If there are differences between the program as designed and the program as implemented by the program sites, what are the reasons for these differences?

Alignment of Local-level Implementation and Program Design

Like the other sites in this study, Site C became a STEP site within the first five years of the availability of NYSED’s STEP grant. Site C’s first STEP grant was given in 1987. This site was privately funded and was the first of the four sites located in New York City. Like Site B, STEP’s administrative staff for Site C coordinated the program solely from their post-secondary institution’s campus – nationally renowned for excellence in STEM studies.

Approximately 50 – 100 youth participated in Site C’s STEP. Although NYSED expects STEP grantees to serve seventh through twelfth graders, Site C served only students in the last half of their junior year through the end of their senior year. Site C was able to target secondary upperclassmen exclusively because the site was a part of a
group of post-secondary institutions that applied for STEP funding. Other post-secondary institutions within the group provided STEP services for seventh through tenth graders. These services included coordinating efforts to recruit students for Site C’s STEP.

Site C had the smallest STEP student cohort and shortest program cycle of the four study sites. Despite Site C’s small student cohort, it had the same approximate number of students participating in the STEP student research conference as Site B – a site with almost five times as many STEP students and a program year that was four times longer.

The director of Site C’s STEP, two former Site C STEP students who were hired to assist the director with future student cohorts, a consultant who oversees Site C’s student workshops, and the regional representative for this area were interviewed. Site C’s director was the sole, full-time, staff person dedicated to running its STEP. See Table 4.17 for additional background information on Site C.

Table 4.17. Background of Site C – Program Year 2011-2012

<table>
<thead>
<tr>
<th>Type and Location</th>
<th>Private Post-Secondary Institution, Downstate New York; Administrative STEP Offices Solely on University Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Youth Served</td>
<td>50 – 100</td>
</tr>
<tr>
<td>Participating Youth in STEP Student Research Conference</td>
<td>Yes (5-10 youth)</td>
</tr>
<tr>
<td>Reported Impact of Day of Service Activities</td>
<td>Not specified</td>
</tr>
</tbody>
</table>
The following section outlines some of the core program activities conducted by Site C’s staff: (1) Student Workshops, (2) Job Shadowing, and (3) the Parental Component.

**Student Workshops**

Unlike the other three study sites, the main focus of Site C’s student workshops was to prepare submissions for the STEP student research conference and to increase the scores that STEP youth received on the Scholastic Aptitude Test (SAT) for college admission.

All Site C students had to work in groups to complete a community health project on a human services or medical topic. Sample topics included teenage depression, asthma, and diabetes. As part of the project, STEP students created a poster presentation that was graded by Site C’s staff. The student groups with the most sound research and articulate presentations were sponsored to compete in the STEP student research conference. Unlike the other three sites, only seniors at Site C were allowed to compete at the conference.

Preparing for the STEP student research conference presented Site C’s STEP students with challenges that better prepared them for the future rigors of medical study:

“It was a great experience – intimidating. Just because you have a lot of very important researchers, very important doctors, very important people coming around to look at your project and ask you questions about it. Because you’ve done so much research on it, you kind of feel a bit more comfortable. But it’s still intimidating because you have people ask you questions sometimes that you didn’t really think about.” – Assistant to the Director 1, Site C

As Site C’s juniors completed their community health projects, the students focused on preparing for the SAT during the last part of their junior year. Students were
coached two evenings a week for ten three-hour sessions from February through May. The SAT coaches were typically college students who scored at least 600 points on the SAT subject they were teaching. During these sessions, Site C’s STEP students also received assistance with preparing for the college application process:

“Each night there’s an activity [such as] registering for the SAT or learning about how to ask for letters of recommendation and filling out a form of who you’re going to ask, what kind of brag sheet or résumé to give to your guidance counselor to write that recommendation. . . Doing research and compiling a list of colleges.” – Local Administrator 2, Site C

Site C’s students also received assistance with completing a personal statement for each college application. While students were receiving this assistance, the coaches established mentoring relationships with each student. Coaches and students discussed expectations for college life: what it may be like living with a roommate, thinking about a major, and whether they should consider applying for a job through the Federal Work-Study Program. Students also took at least one college trip with their coaches and learned about the financial aid process for college.

**Job Shadowing**

A distinctive feature of Site C’s program was its job-shadowing component. Unlike the other study sites, a main focus of Site C’s summer program was pairing its STEP students with medical doctors so that they could “shadow” or closely observe what doctors do in a typical day. A former Site C STEP student who returned to the program to assist the director during the summers of 2008 and 2009 recalled the challenges of connecting the youth with the doctors:

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12 SAT scores on a section range from 200 to 800 points.
13 The Federal Work-Study Program is administered by the United States Department of Education and provides part-time jobs to college students as part of their FAFSA award allotment.
“So in the morning they would have different students shadow different doctors. I think that probably was the most challenging because doctors have very, very busy schedules. And their schedules are very sporadic. So sometimes it is hard when you call a doctor and expect him to be there. Sometimes things get lost in translation and either they’re not there or they haven’t informed their staff or their team that one of the students is going to be there.” – Assistant to the Director 1, Site C

Despite the coordination challenges that may occur, the opportunity for Site C’s students to work with doctors from a nationally renowned institution set Site C’s STEM career development support apart from the others. Site C’s students were exposed to the medical culture first-hand as opposed to hearing about it from others.

**Parental Component**

Like Site A and Site B, Site C did not have an active parent group. Plans to establish a parent-steering committee were described in Site C’s 2011-2015 STEP proposal. These plans include beginning the program year with an orientation session and a parental needs assessment. One of the main functions of the parent-steering committee is to meet with program staff, seek direction regarding program activities, and disseminate that information to Site C’s director as well as all STEP parents. Another function of the parent-steering committee is to assess the Day of Service activities.

Although a structure for active parent involvement was described in Site C’s STEP proposal, it was typical for few or no parents to volunteer to serve on the committee. One of Site C’s administrators drew attention to the challenge of getting parents to participate:

“The other challenge is trying to get the parents more involved to come down to [Site C.] We’re not that easy to get to. . . Our kids come from all over the City. We’re also trying to do a parental component to empower them to be more of a part of the process with college applications, and the FAFSA process. We’re working hard to get them to come.” – Local Administrator 1, Site C
This administrator also remarked that the challenges Site C faced regarding active parental involvement may have been due in part to the students’ participation in only their junior and senior years. If the program was a longer or four-year program, there would be more time for program staff to identify ways to increase parents’ participation.

Data for Research Question 4: SITE C

4. What are the overall strengths and weaknesses of the program in terms of the fundamental program design?

STEP’s Eligibility Requirements

While only admitting juniors and seniors to Site C’s STEP program may negatively impact parental involvement, serving only upperclassmen had a number of benefits. For example, Site C’s staff was able to focus on offering activities that helped its students transition from high school to college and beyond. Earlier in the program’s history, Site C’s staff tried to simultaneously provide STEM career development support for younger and older students:

“We [used to take] kids from different grades. Freshmen, sophomores, juniors were all in the same class and at different educational levels. The following year [2003], it was [mostly] juniors. We had four or five freshmen. This didn’t work when doing the projects [due to] their maturity. We decided that we’d better work with juniors.” – Local Administrator 1, Site C

Designing Site C’s program to only serve upperclassmen did not negatively impact the efforts of Site C’s staff to recruit students. In contrast, Site A described challenges with recruiting students from high school. And although Site B’s staff shared that sometimes they had to turn students away, the number of students seeking acceptance into Site C’s STEP was large.
As a regular practice, Site C’s staff was not able to accept all of the student applications that were submitted for its STEP program. Site C’s recruitment process— including contacting area high schools and providing information at Day of Service and other career events in the community—typically generated three times the number of student applicants than the number of available slots.

**Students’ Academic Preparedness**

Being able to work exclusively with STEP students as juniors also gave Site C’s staff a greater opportunity to identify students who were able to excel academically. Like the other study sites, Site C’s STEP students were expected to have at least a B school average. Moreover, Site C’s STEP students must have had at least an 85% average on a high school transcript that included three courses of math and science. The other sites did not indicate that level of specificity.

Site C also examined students’ Regents exam scores for math and science courses as well as the likelihood of students earning an advanced Regents Diploma. How well students scored on the precursor to the SAT, the Preliminary Scholastic Aptitude Test, was also a primary consideration for student acceptance into Site C’s program.

The second part of Site C’s screening process involved examining student participation in internships, community volunteerism, or other extracurricular activities that indicated exposure to the medical, science and/or health fields. Prospective students also completed a personal statement that described their understanding of and commitment to the program. As part of the statement, students were also expected to describe their aspirations and motivation for wanting to participate in Site C’s STEP.
Students were also required to submit letters of recommendation from science and math teachers as well as school counselors or principals as part of the screening process. This robust screening process enabled Site C’s staff to work with students who were very motivated about becoming STEM professionals and willing to make the effort to prepare for the rigors of college life:

“It’s the quality of kids we get. They are really gung ho. They want to accomplish something. . . We try to get kids who have a B average, know how to write but are still on the fence. They are B students but could be A students. We don’t want to be an elite program. We’ll take a couple of A students to lift up the group. . . students who are hardworking and focused.” – Local Administrator 1, Site C

**College Readiness**

Site C’s relationship with a consultant group that specializes in SAT preparation increased the likelihood of admission to colleges that Site C’s students chose. The STEP students worked in small groups of 4-6 youth with a dedicated SAT coach. Coaches were typically college students who had taken the SAT within a couple of years of working with the STEP students so they were able to readily recall successful strategies they used to excel on the SAT. The coaches shared these strategies with Site C’s STEP students. The goal of each coaching session was to improve each student’s baseline SAT practice exam score so that students would achieve similar or greater success than their coaches had on the exam.\(^\text{14}\)

Site C’s staff also matched STEP students with mentors to increase college readiness. The mentors were medical students whose gender, ethnicity, and research interests matched that of their STEP mentees. The mentors were encouraged to share

\(^\text{14}\) As discussed earlier in this chapter, coaches must provide evidence of scoring at least 600 of 800 possible points on the SAT in order to be able to work with STEP students.
personal biographies that would help Site C’s students develop academically and socially. Site C’s mentors were also chosen because they wanted to work with youth and were prepared to set time aside to build the mentor-mentee relationship. The mentors and STEP students arranged their own meetings:

“They communicate via e-mail or phone. Or they can meet for coffee and snacks in the cafeteria. . . to [build] that relationship encouraging them [the STEP students] to do medical studies or whatever other profession the students are considering.” – Local Administrator 1, Site C

If Site C’s STEP students had challenges with completing their high school requirements, including Regents or other standardized tests, the mentors also served as resources to ensure timely graduation from high school.

Data for Research Question 5: SITE C

5. What are the overall strengths and weaknesses of the program in terms of how the program has been implemented?

Location of STEP Offices

Site A and Site B recruited students from 12 and 6 high schools, respectively. In contrast, Site C accepted applications from more than 100 high schools throughout New York City. The participating high schools changed depending on which students were accepted into Site C’s STEP program. Under these circumstances, it would have been impractical for Site C’s staff to have a physical presence at the schools where STEP students attend.

One of the major goals of establishing a physical presence in a partnering secondary school is to fortify the working relationship. Schools that do not have a STEP
office within close proximity may be more likely to collaborate with staff from other student programs – programs that have satellite offices on their school campuses. In Site C’s case, its reputation for implementing a program sponsored by a nationally renowned college sufficiently drew attention and interest from the educational staff at New York City’s area high schools. This interest was indicated by the large number of student applications submitted for consideration as a Site C STEP participant.

**Program Staffing**

The 2011-2015 NYSED grant proposals of all the study sites described offering supervised career-oriented internships for students during the summer. Unlike Site A and Site B, Site C has been able to dedicate enough staff to be able to implement its student internships or job-shadowing activities during the summer.

Site C conducted a survey of its STEP student graduates that solicited feedback regarding their job-shadowing experiences. The survey’s findings were included in its 2011-2015 grant proposal. As part of the survey, Site C’s STEP graduates identified their job-shadowing activities as having made a significant impact on confirming and strengthening their career interests. Job shadowing also allowed Site C’s graduates to immerse themselves into the lives of healthcare professionals as they gained entrance to a social network of individuals with similar interests, backgrounds, and life experiences. The importance of making connections with social networks that can yield social capital resources or assets that develop from interacting with people is discussed in greater detail in Chapter 2.
**STEP’s Male, African-American, Latino, and Native American Participation**

Earlier in this chapter, the percentage of males who participated in the 2010-2011 STEP program year was cited as 38%. How can more underrepresented ethnic minority students in STEM fields who are male benefit from the social capital resources that STEP offers?

In their 2011-2015 STEP grant proposals, Sites A, B, and C described their ability to meet Priority 1 or the establishment of program services designed to improve recruitment and retention of historically underrepresented male participants at a developing level. STEP program implementation efforts at the developing level for the 2011-2015 grant cycle include the following:

- Site A will recruit a portion of its male students to be part of a focus group. The focus group’s goal will be to identify ways to improve male students’ academic success.
- Site B will provide group presentations, instruction in math and science, career counseling, male role models as instructors/speakers, male STEP alumni and C-STEP student mentors. Site C’s efforts to address this priority included having mentors for the STEP students who were medical students from historically underrepresented ethnic backgrounds, and focusing STEP student recruitment efforts on all-male secondary schools in New York City.

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15 A developing level indicates that the services are not provided in all targeted grade levels.
16 Site D identified its level of addressing STEP male underrepresentation as proficient. “Proficient” is the most advanced level of NYSED’s rubric for STEP sites to evaluate their program capacity. Additional details regarding Site D’s STEP follow at the end of this chapter.
One of Site C’s administrators raised concerns regarding male access to STEP:

“We need to get more Black and Latino boys. All of these pre-college programs are looking for males, especially Blacks and Latinos. So that’s part of the focus. We have 34% boys. It’s been up. Our goal is to increase every year. . .It’s hard to get boys unless I concentrated on a boys’ school. We plan to work more closely with [names of two high schools for boys] in order to recruit more boys. We plan to do more site visits.”

– Local Administrator 1, Site C

Finding ways to allocate more resources for increasing the number of STEP male participants was an ongoing concern across all study sites. Studies of the male achievement gap have garnered national attention. A study released in the *Journal of Human Resources* examined achievement gaps between standardized test scores of students and teacher-assigned grades (Cornwell et al. 2013). The study was based on data from more than 5,800 students from kindergarten through fifth grade. Gaps in gender achievement were found to be substantially wide in comparison to achievement gaps among racial groups. For example, “the gender gap in reading—which favors girls—is over 50 percent larger than the corresponding Black and Hispanic achievement gaps. The estimated gender gap increases into the fifth grade and becomes larger in magnitude than the Hispanic gap in every subject” (Cornwell et al. 2013, 238).

The study concluded that while “standardized tests were important, teacher-assigned grades are arguably more consequential given the role they play in class placement, high school graduation, and college admissibility” (Cornwell et al. 2013, 238; 239). Cornwell et al. also found that the ability of girls to display a more developed attitude toward learning and teachers – subconsciously or consciously – rewards girls for this even when boys outperform girls on standardized tests.
The national attention that the male achievement gap issue has garnered is reflected in the continued efforts of the STEP study sites to increase their male representation.

**The State Budget and Summer Programming**

Like the other study sites, concerns were raised by Site C’s administration regarding the timing of the release of expected STEP funding:

“The money doesn’t come in until late. It’s the fault of the people in charge. It’s the State. Sometimes [New York State’s] budget is late and the program can’t pay staff. Our school picks it up. For some programs, the school doesn’t want to kick in the money. Way back they [the State] cut 1.5 million dollars from all state programs. Now they want to give it back. The fiscal year ends in June [three months away], but we haven’t been given the go ahead. This will prevent us from distributing the money in a timely fashion.” – Local Administrator 1, Site C

Although there was this concern, Site C’s staff managed to continue summer programming – including placing STEP students with medical doctors to shadow them—without interruption. Unlike Site A and Site B, Site C’s sponsoring post-secondary institution had monies in reserve to continue full STEP programming year round despite the delayed release of the State’s promised STEP funding.

**Data for Research Question 6: SITE C**

6. What are the implications of the research findings for future research and policymaking regarding career development programs focused on recruiting and preparing youth for STEM occupations?
Program Sustainability

Site C’s commitment to program sustainability extended beyond its fiscal support of uninterrupted programming for the full year. Consistent with the goals of the Regents’ Action Paper, Site C was part of a network of STEP sites in medical schools in New York City that collaborated to provide joint activities and track student progress.

Like the other study sites, Site C was a member of a STEP/C-STEP regional group that helped to identify resources that could help all sites recruit and prepare youth for STEM careers. Site C’s regional representative played a leadership role in providing NYSED-funded services to underrepresented ethnic minorities in STEM fields for more than 25 years. Like the regional representatives for Site A and Site B, Site C’s regional representative described the function of the group as one that served a substantive communication role:

“I think it’s worked well. . .to bring the region [together], to work together, know each other, collaborate on activities, help speed up communication from STEP program to C-STEP program, from community college to senior college—joining together as a cohesive unit to meet the goals of the STEP and C-STEP grants. And also to basically get the members of the region to participate in statewide activities, statewide committees, and disseminate information so that everybody knows what’s going on with this highly political grant.” – Local Administrator 2, Site C

Advocacy and Coordination

Finding ways to encourage parents to become substantive partners in STEP programming has been an elusive challenge across Sites A, B, and C. Although Site C reported much student success, including a 99% program retention rate and students with high academic standing, involving the parents of its students in planning STEP activities is still a concern.

17 Site C’s regional representative also serves in this capacity for Site D.
Perhaps there is an opportunity for Site C’s staff to intensify their advocacy efforts with its STEP parents. Having a post-secondary institution with the national standing that Site C’s sponsoring university has may encourage greater parent participation. Site C’s STEP parents could be offered incentives connected with the university.

For example, Site C’s staff could identify STEP parents’ career goals based on the parental assessment they already provided during the beginning of the program year. Parents’ goals may include the completion of courses at a prestigious university, like the one that sponsors Site C. Parents who are active participants on the parent-steering committee described in Site C’s STEP grant proposal could receive tuition waivers to attend one or more courses at Site C’s university.

If parents have these interests, Site C’s staff would be prepared to help parents navigate the application process for admittance into the university. Site C’s staff could guide interested STEP parents through some of the same challenges and remedies that their children may face during their application process.

This type of parent initiative would be consistent with the final tenet of Requirement 5 of Site C’s 2011-2015 STEP grant proposal: “Outline the relationship between the parent and the program.” By utilizing university incentives, Site C’s staff could define the relationship between itself and its parents as one that extends beyond STEM career development to the STEP students. This extended relationship could yield great benefits including increased parental motivation to devote more time to planning STEP activities.
Smaller scale university incentives could also be offered. Depending on what information parents provide in their individual assessment, offering other incentives like movie or restaurant certificates at the university’s facilities may prove as fruitful and less time consuming to coordinate. Whatever the parental incentive offered, Site C’s goal would be to promote genuine partnerships between program staff and parent-steering committee members (Anderson-Butcher et al. 2004, 7.13; 7.14). See Appendix G for additional information on how to foster parent partnerships in educational settings.

Enlisting the aid of an organization that specializes in creating active partnerships between parents and administrators of programs like STEP would also be helpful. Site C has already experienced positive results from applying this logic when it partnered with the SAT preparation consultant group to increase its students’ scores on the test. With only one full-time time person dedicated to running Site C’s STEP, having expert assistance with a parent advocacy effort would be key.

CASE STUDY FOUR

Data for Research Question 3: SITE D

3. To what extent does implementation of the program by the program sites align with the program as designed at the state level? a. If there are differences between the program as designed and the program as implemented by the program sites, what are the reasons for these differences?
Alignment of Local-level Implementation and Program Design

Like Site B, the other study site sponsored by a public university, Site D became a STEP site in 1986 – the first STEP program year. Site D served more than 300 students making it responsible for the largest number of students of the four study sites. Those students attended middle and high school, receiving STEP services through the end of their senior year. Due to the large student cohort at Site D, the staff chose not to send any students to the annual statewide student research conference. Site D was the only study site to refrain from participating in the conference. Instead, Site D’s STEP students were offered local opportunities to conduct research experiments.

One of Site D’s program administrators elaborated on the rationale for not including the student research conference as an activity:

“I’m going to be quite honest…while we should participate more, I can’t remember the last event that we actually did. …We aren’t talking about something that every student in STEP could possibly be a part of. Usually it’s a small contingent of students. …When we looked at it, it wasn’t cost-effective at all. …A group of, say 20, was extremely expensive.” – Local Administrator 2, Site D

Site D’s staff had offices both on the sites of the secondary schools where STEP students were recruited and its sponsoring university. Interview data from the executive director, a program director, database coordinator, and the area’s regional representative were used. Like Site A, all of Site D’s core staff, with the exception of the regional representative, worked full time to provide STEP services to its students. See Table 4.18 for additional background information on Site D.
Table 4.18. Background of Site D – Program Year 2011-2012

<table>
<thead>
<tr>
<th>Type and Location</th>
<th>Public Post-Secondary Institution, Downstate New York; Administrative STEP Offices on Campuses of the University and Secondary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Youth Served</td>
<td>more than 300</td>
</tr>
<tr>
<td>Participating Youth in STEP Student Research Conference</td>
<td>None</td>
</tr>
<tr>
<td>Reported Impact of Day of Service Activities</td>
<td>Not specified</td>
</tr>
</tbody>
</table>

Site D was unique from the other study sites in a number of ways. The following section outlines some of the core program activities conducted by Site D’s staff: (1) Curriculum, (2) Parental Component, and (3) Database.

**Curriculum**

The academic curriculum of Site D’s STEP students was determined by the principals and assistant principals of partnering schools in conjunction with Site D’s staff. Site D’s STEP students were given an accelerated curriculum, one that would increase the likelihood of their being accepted into the STEM college of their choice. No other study site had this much involvement in directing the secondary school curriculum of its students:

“The purpose of the STEP program is…to really push underrepresented minorities in the areas of science, technology, engineering, and math-related majors – what the State considers professional careers. One of the…State mandates is that….you graduate or you push students successfully. . .We’re looking for students to graduate with advanced Regents diplomas. . .advanced Regents with honors.” – Local Administrator 2, Site D

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18 See Appendix E for the list of professional careers or professions that are licensed, registered or certified by the Regents.
To complement the curriculum, Site D offered student workshops. Topics discussed during the workshops included financial aid assistance, the college application process, and school-college readiness. Site D’s STEP juniors and seniors who were excelling more than the others and would apply to the most selective colleges attended special sessions. These students used modern DNA laboratories as part of advanced workshops where they completed their research projects.

Like Site C, all Site D’s STEP students shadowed doctors or completed clinical placements. Students received more practical exposure to the medical fields although they were encouraged to consider pathways in all of the licensed professions. Once the placements were completed, Site D’s students were brought on college tours of the campuses where the placements occurred. This made the connection between their student research and college aspirations clearer:

“We put them in research environments to polish that part of their résumé. And then we do workshops and we bring in actual admissions officers from some of your elite and Ivy League colleges to help them hone from that vantage point their profiles as well.” – Local Administrator 3, Site D

**Parental Component**

Site D employed a team approach to coordinate its student services. Science, math, social studies and English teachers; school counselors; school administrators; the parent coordinator (whose role is discussed in more detail later in this section) and parents were members of the team. Unlike the other study sites, Site D had parent groups that played an active role in team decisions:

“We’re always trying to change and improve based on data and experiences in the program. And we get parent feedback. There are school administrators, teachers. There’s just a whole [cadre] of adults involved in the program at various school sites, pushing students and parents.” – Local Administrator 3, Site D
This team approach enabled responsibility for Site D’s student success to be shared. Staff from the secondary schools, Site D, and the students’ parents were all expected to play a significant role in identifying STEM career development support for the STEP students. The team met on a regular basis to examine the student cohorts and discuss student successes, failures, and weaknesses. An administrator described the parental component as extremely important:

“The parents meet periodically with the team. Sometimes it's monthly meetings, sometimes quarterly. The team meets with the parents so parents are aware of issues…going on with the students.” – Local Administrator 2, Site D

During team meetings, plans for remediation during afterschool tutorials were discussed and outlined. The philosophy of Site D’s staff was that most minority and economically disadvantaged students who enter high school with basic skills can successfully complete a rigorous Regents curriculum. With appropriate support, including a strong pre-collegiate educational foundation, its STEP students can enter and complete senior colleges within four or five years.

Ensuring that parents partner with school district and STEP staff was an integral part of the STEM career development support that students need at this stage. Unlike the other sites, in its 2011-2015 STEP proposal, Site D described working with a parent coordinator to ensure that parents were actively involved in the pre-collegiate education provided to its STEP students. The parent coordinator was employed by the partnering secondary schools.

As part of Site D’s plan to support substantive parental involvement, STEP parents will also be provided with a guide. The main purpose of the parents’ guide is to
help parents build and develop skills to effectively communicate with the parent coordinator. The guide will also include information about how to take advantage of STEP resources that can increase their children’s college readiness and ability to realize career goals. Parents are given information that will help them coach their children to set career goals based on their children’s interests, abilities, and aspirations.

**Database**

Another unique feature of Site D’s STEP program is its reliance on student data to guide programming decisions. For more than 20 years, Site D has tracked its students’ academic averages, Regents scores, as well as their PSAT and SAT scores. This comprehensive database also tracked internships that students completed and their career interests. Once Site D’s STEP students graduate from the program, information regarding the graduates’ chosen college majors and career paths was also stored in the database.

Beyond NYSED grant expectations, Site D has also used staff resources to conduct one-on-one interviews with its STEP graduates in order to enrich the database:

“...The type of questions you ask is important. ... Because basically we’re looking to see that this is what you [the STEP student] indicated that you would do. You know, where you are today. But when you start asking ‘Did you graduate?’ those questions can be a little tough for some students. So you begin to see all of these people – where they are, where they went, what they started to do. ... So we can easily with a click see those. ...” – Local Administrator 2, Site D

The database has also helped Site D demonstrate the fidelity of its STEP program. Through utilizing its database’s tools, Site D’s staff was able to show how its program’s activities aligned with the program design of the framers of the Regents’ Action Paper and NYSED. The program strived to exceed NYSED expectations:
Certainly the core requirements we follow completely. They [NYSED staff] used to come every year and make an audit. They would spot check. They would go over our roster and make sure that we had all of the papers for each student. I think with funding cuts they do a lot less of that or with programs that have been around a lot longer. The documentation [we have] is so good. . .” – Local Administrator 1, Site D

The challenges NYSED’s staff encountered with smaller numbers of staff assigned to oversee STEP and the use of regional representatives to support local programs was discussed earlier in this chapter.

Data for Research Question 4: SITE D

4. What are the overall strengths and weaknesses of the program in terms of the fundamental program design?

STEP’s Eligibility Requirements

Site D has used its database to track the eligibility of its middle school students for participation in STEP as high school students. While having the database was a programming strength, data that students self-report can pose challenges. For example, students identified themselves as members of ethnic categories that were not captured by NYSED reports or Site D’s database tools:

“Some students have reclassified themselves. . . How they identify themselves on the form is what we use and what the State accepts. What we were finding in terms of the policy is that students were identifying themselves in other categories…. For 'other' [students would add] Trinidadian, Guyanese. That becomes a problem because technically these kids are not considered American. . .”

“It really became a problem in some schools. How do you get students and their parents – it’s really the parents that drive that – how do you get the parents to understand the importance of the funding? The importance of where they see themselves? And how they see themselves? And I can’t tell you how many students because they are non-STEP based on their identification, they get filtered in queries.” – Local Administrator 2, Site D
When students were filtered they were deemed ineligible for the services that STEP provided. As discussed earlier in this chapter, Site A’s staff reported similar challenges with helping potential students to complete applications for admittance into STEP. Potential STEP students with biracial, ethnic backgrounds were reluctant to identify themselves as solely African-American. NYSED has since added a biracial category to address this concern. There were no additional categories in the 2011-2015 STEP application to address the challenges that result from students who identify themselves as “Trinidadian or Guyanese.” As a result, Site D’s staff has had to pay close attention to the ethnic background data that the students report and continue to provide related counseling.

Like the other study sites, to be eligible for Site D’s STEP, students must have at least an 85% average and be at grade level. How schools determine grade-level performance was raised as a concern by Site D’s staff:

“Over the years, what’s considered grade level has become a lower and lower level. But we still try to admit students who are at least grade level which means that they have basic skills to at least engage in a real ninth grade curriculum. And unfortunately, that’s not the case for many students entering high school.” – Local Administrator 1, Site D

As discussed earlier in this chapter, staff of Site A and Site B had similar concerns regarding the academic preparedness of its STEP-eligible students. However, Site D has used its student data to drive their STEM career development support strategies regarding its program design. For example:

“There’s no effort that we could find that students were understanding textbooks. In fact textbooks were infrequently used in most schools. So we designed a literacy program based around how to use textbooks, learn from textbooks and integrate them with the rest of learning. So that was a response we had to improve all students’ performance across
the board. . . Our data . . . pointed out to us what we might be able to do more with.” –
Local Administrator 1, Site D

Staff from Site D also developed a comprehensive peer-tutoring system as a main
feature of its STEP. Like the other study sites, Site D sought tutors who were from the
same ethnic background as their STEP students. Site D staff used a peer-tutoring manual
designed specifically for increasing the academic aptitude of historically
underrepresented minorities. The program helped successful students to become tutors:

“Students can help students in some cases better than teachers helping students.
And I’m not going to belittle the role of the teacher, by any means. But we found that as
a supplemental approach to help kids, a peer-tutoring program, especially [with] the use
of non-traditional students was tremendous…especially when they [STEP students] have
the language barrier.” – Local Administrator 2, Site D

**College Readiness**

Site D’s 2011-2015 STEP proposal describes program services that are designed
to provide students with social and emotional resiliency skills. These are supports —
discussed earlier in Chapter 2 — needed for admission into highly selective colleges and
programs leading to success in STEM-related careers. Site D was designed from its
beginning to increase the number of historically underrepresented ethnic minorities in
STEM careers, regardless of the mediation strategies that would be needed to make
students college ready:

“We really started out…very focused on getting kids to medical school or Ph.D.
programs. . . If you take a ninth grader at random, the chances they’ll get into medical
school is about 1 in 300. So we’ve gotten about 10% in over the years. Which is like 30,
40 times over the national average.”

“That means 90% don’t go to medical school. And you don’t want a program
where kids are saying, ‘Gee, I’m a failure,’ or ‘I’m not meeting the goals.’. . . The goal to
prepare students to enter college without need for remediation and…complete college in
4 or 5 years became equally important to getting students ready for careers in medicine.”
– Local Administrator 1, Site D

Longitudinal NSF (2012) data regarding the scant number of doctoral awards for Life Sciences, Physical Sciences, and Engineering degrees in the United States were discussed earlier in this chapter. At all four study sites, NSF data on low numbers of doctoral recipients inspired STEP administrators to maximize program impact.

**Data for Research Question 5: SITE D**

5. **What are the overall strengths and weaknesses of the program in terms of how the program has been implemented?**

**Location of STEP Offices**

Although Site D served more than twice the largest number of STEP students that participated in any of the four study sites, it recruited youth from only 13 schools throughout the New York City area. This was a tenth of the number of schools from which the smallest study STEP program, Site C, recruits its students. Like the staff of Site A (who recruited students from 12 schools), the STEP offices of Site D’s staff were located both on the campuses of the secondary schools they served and their partnering post-secondary institutions. This daily proximity allowed Site D's STEP staff to play an integral role in the school culture that supported students' STEM career paths:

“In our program a very large percentage [of activity] takes place in the school building because that’s where the students are. We can really impact. . .their curriculum, their support services and everything else.” – Local Administrator 1, Site D

“Again, I’m going to point out the uniqueness of our program. . . Usually the routine [of other STEP programs] is they offer some precollege type of workshops in addition to consistent. . .maybe math or science courses to help the students to either increase their academic ability or eliminate whatever remedial deficiencies they may
have. By us being in the schools, we handle the situation differently.” – Local Administrator 3, Site D

Like Site A, Site D’s staff emphasized the importance of being in the schools where their STEP students learned every day. Site D’s administrative staff also commented that due to this proximal working relationship, it was easier to ensure implementation of the program’s design. For example, the staff could witness their STEP students receiving the tutoring and other supports that they need. The location of the offices of Site D’s STEP staff within the schools increased the likelihood that program initiatives were both written and practiced.

Maintaining a consistent presence on the school grounds also enabled Site D’s staff to implement policies that cultivated the drive of its students to complete the rigors of the academic day:

“There is no typical day. I am very hands on. . .For example, I often meet one on one with STEP students to assess their needs. So I know students by name and by face. . .I work with [students] on a set of activities to help build their confidence. A lot of the students fear rejection and do not apply to top-tier schools because they think their applications will not be accepted. I help them work through this. . .” – Local Administrator 3, Site D

**STEP’s Male, African-American, Latino, and Native American Participation**

Like the other study sites, Site D’s staff emphasized the importance of implementing policies that built student self-confidence as youth challenged themselves academically, socially, and/or behaviorally to pursue STEM careers.

This emphasis was consistent with Site D’s 2011-2015 STEP grant proposal. Site D addressed the proposal’s Priority 1 or program services designed to improve recruitment and retention of historically underrepresented male participants in all targeted grade levels by describing the creation of a student development team. Activities
associated with this team’s outcomes included individual and group counseling as well as student development of study skills and time management. Participants were also expected to develop social and emotional resiliency needed for admission into highly selective colleges and programs leading to success in STEM-related careers. According to a Site D administrator, Site D's strategy for providing resiliency support for underrepresented males focused on professional development of STEP personnel.

As discussed earlier in this chapter, identifying ways to shorten the achievement gender gap that has favored females since the 1960s is of national concern (Cornwell et al. 2013). As part of the 2011-2015 grant cycle, Site D has partnered with a community-based organization that has studied the male achievement gap issue longer. This partnership led to the development of a three-phase approach which began with professional development for personnel. Site D’s staff also planned to implement workshops for students and parents that specifically address male underrepresentation. Next steps included working with the STEP/C-STEP regional representative committee to develop strategies.

**The State Budget, Summer Programming, and Department of Education Funding**

The administrative interviewees emphasized the importance of consistent funding to plan effective programming. Like the other study sites, Site D has had to make accommodations to support grant activities that have been approved from the State – activities that include expanding Site D’s services to more students:

“As much as we appreciate every drop of money that the State has given us as we grow, we’re now at a trade-off with having consistent funding or funding that really doesn’t fluctuate much. And of course we understand from the state level why that happens. But when you increase the population [of STEP students] you’re now at a point where you’re not able to give out more resources per student…But do you focus on trying to continue with the quality of services that you provide? Or do you maximize
your number? . . . That’s a trade off. And that’s really where we are right now.” – Local Administrator 3, Site D

Another Site D administrator remarked about the impact of the current State-funding process:

““It’s always a challenge…If the funding disappears tomorrow due to politics or whatever, then what’s going to happen to the students who were in the loop? [sighs]” – Local Administrator 3, Site D

Despite the challenges regarding STEP funding, Site D’s administrators expressed a commitment to find ways to sustain the program; this commitment was shared across all four study sites. While Site A and Site B eliminated summer programming as a result of delayed funding, Site D reduced the number of school counseling staff to accommodate funding gaps. In this manner, Site D was able to maintain the large numbers of students served throughout the school year and summer while potentially sacrificing the substance of STEM career development support that was provided.

Site D’s staff also received major funding from the New York City Department of Education (DOE) for STEP activities. These funds were governed by DOE mandates which could make program implementation difficult:

"We are working inside an extreme. . .example of bureaucracy, being that of the…DOE now. . .We have to kind of ‘play nice’ in their system. Things that we may want to do, or like to – it’s never automatic because there is a higher chain of command that has to be followed. Not only through the teacher but also through whoever their supervisor is . . . As long as you have a principal who is gung ho about your program, that’s probably 80% of the battle.” – Local Administrator 3, Site D

Chapter 2 outlines challenges that typically surface when implementing policies within bureaucratic structures. Despite STEP-funding challenges, Site D’s administrators were committed to sustaining the program. While Site A and Site B were unable to
provide summer programming as a result of delayed funding, Site D reduced school counseling staff to address funding gaps. These adjustments were deemed worthwhile given the continued student success of Site D’s STEP:

“I have gone now from meeting students in ninth grade to actually having students that I personally have worked with that are now doctors, residents. So I’ve actually seen some of the fruit of my labor come through the whole process. . . That’s only been within the last two years. . . And I’ve been able to say, ‘Okay, I knew you since ninth grade. Now you have a white coat here.’ That’s the scope. They’ve gone through it.” – Local Administrator 3, Site D

Data for Research Question 6: SITE D

6. What are the implications of the research findings for future research and policymaking regarding career development programs focused on recruiting and preparing youth for STEM occupations?

Program Sustainability

One of the architects of the Regents’ Action Paper pointed out that a small number of STEP site applicants in 1986 – when Site D’s staff applied – were familiar with providing support for underrepresented ethnic minorities in STEM careers:

“After we received the money we had to develop requests for proposals. And we also had to be very clear on who's eligible to participate and receive the funding. So one of the challenges was helping . . . them understand ways in which they could find ‘so-called’ qualified minorities to come into these programs.”

“We had to go out into the field, really we were on the road probably 50% of the time training people and working with institutions on ways to recruit and enroll students. . . And that was a challenge because most of the colleges and universities didn't have a lot of experience in doing that nor had they really looked for opportunities to do it.” – Former NYSED Administrator

In contrast, Site D had experience serving underrepresented ethnic minorities well before STEP began:
“We had been involved in pre-college education [before STEP started] as part of a math school program. We had a large grant from a foundation to start a grade 9-12 program in several high schools. [STEP] was widely publicized. . . And we had been active for awhile. So it was a very natural fit for us to apply. We were doing this and certainly the STEP funding was really an essential component to building the program.” – Local Administrator 1, Site D

This Site D administrator’s comment reflects the motivation of program staff who are responsible for implementing STEP’s design. (The substantive role of staff motivation in policy implementation is discussed in greater detail in Chapter 2.) This motivation has enabled Site D’s staff to anticipate barriers to policy implementation so that they are able to effectively advocate for and coordinate their STEP.

**Advocacy and Coordination**

Staff from Site D discussed challenges that may arise from working with professionals across the 13 secondary schools to implement STEP’s policy design. One administrator described anxiety over the supervisory structure in the secondary schools:

> “Just remember that the principal still has to answer to his superintendent and to his chancellor and all the way up as well. . .So I mean everybody’s got somebody looking over their shoulder.” – Local Administrator 3, Site D

A keen understanding of organizational culture has helped Site D when working with multiple schools and more than one government agency – NYSED and the DOE. Each organization has discretionary power which can impact how the program design is actually implemented (Gerston 2010). Site D’s staff described shepherding policies through each organization – each with its own rules, practices and principles – as requiring great skill. In particular, there have been challenges pertaining to resources. Site D staff have had to contend with staff from competing programs who question the resources allocated to STEP.
From 1842 to 2001, New York City’s public school system was under the auspices of ward trustees and a city board of education (Folts 1996). From 2002 to the present, New York City’s public schools have been run under mayoral control by the New York City DOE.\textsuperscript{19} The DOE downsized a number of New York City’s public schools, including schools that Site D’s staff has established partnerships with over the years:

“. . . When the [DOE] funding tightened up it became tougher and tougher. [Partnering school districts] may want to [implement STEP] but their hands are tied because . . . they are observed and monitored by no longer the superintendency, but their region. And so the DOE may have mandates that they have to meet and [STEP] might be seen as important, but it may not be seen as a large enough entity within the school. So that becomes very tough.”

“And of course we also have the issue of naysayers. . . ‘Why do you [STEP] students get all of the resources?’ So you have to be careful that you are not infringing on or violating DOE rules. . .” – Local Administrator 2, Site D

Site D’s staff are committed to STEP advocacy. However, maintaining relationships with public school personnel has been challenging:

"The principal says, ‘Tomorrow I’m leaving. I’m going to another school.’ So you’ve got to rebuild relationships constantly. I think that’s the nature of what we do. I can’t complain. It’s just the way it is.” – Local Administrator 1, Site D

The downsizing of New York City’s public schools has made continuous building of new relationships the status quo. As discussed earlier in this chapter, Site D’s physical presence on the public school grounds and extensive experience serving ethnically underrepresented students in STEM careers gave Site D an advantage in rebuilding the relationships needed to sustain STEP’s programming.

\textsuperscript{19} As the leadership of New York City’s mayoral office changes, so may the leadership structure of the DOE or whatever other entity may replace it to run the city’s public schools (Medina 2009).
In contrast, another Site D administrator noted that the working relationship between STEP sites and NYSED has facilitated STEP implementation and advocacy of sustained programming:

“State Ed gives us information about budgets [and]...the Legislature…that we need…in order to run our programs...They’ve been very helpful in guiding us in the writing of the new proposals. ...Those are the kinds of things that the State Ed Department brings to the region. ...The creativity part comes out of the program.” – Local Administrator 4, Site D
CHAPTER 5:
CONCLUSIONS AND RECOMMENDATIONS

This study of the Science and Technology Entry Program (STEP) that is administered by the New York State Education Department (NYSED) offers unique contributions to the research and policy communities. The STEP targets middle and high school students who are African-American, Hispanic/Latino, and/or American Indian/Alaskan Native and/or from low socio-economic backgrounds. Students are recruited for STEP because they intend to pursue Science, Technology, Engineering and Math (STEM) careers that typically require preparation at the undergraduate and/or graduate level – careers in which African-Americans and Latinos are least likely to be represented (Maton et al. 2000; Margolis and Fisher 2002; ACT 2007a; Burger et al. 2007; Meszaros and Kahle 2007; National Center for Women and Information Technology 2007; National Science Foundation 2008; Jackson et al. 2009).

This dissertation focused on New York State’s efforts to mitigate challenges associated with implementing policies that support African-American and Latino youth who are considering a career in the STEM fields. These fields include agricultural sciences, biological sciences, physical sciences, psychology, social sciences, and technology (United States Government Accountability Office 2007). STEP is a nationally recognized program, having received an award in 2003 for excellence in STEM mentoring from President George W. Bush (National Science Foundation 2004).20

The bulk of available knowledge regarding the underrepresentation of ethnic minorities in the STEM fields, including those who are economically disadvantaged, is

20 STEP received the excellence in STEM mentoring award along with its sister organization, the Collegiate Science Technology and Entry Program.
descriptive-explanatory not action-oriented (Callan 2006; Meszaros and Kahle, 2007; Lewin 2010). In other words, it does not provide details about what to do differently and better. This gap in action-oriented knowledge constrains the development of timely policy and implementation; this study responds to that need. What is derived from this study can be turned into action-oriented knowledge, crafting a roadmap for others who wish to explore the nature of STEM career pathway support for populations of youths who to date remain starkly underrepresented as post-secondary graduates across the nation (Martin and Halperin 2006; Lawson 2008).

This research offers guidance for education policy makers and administrators who oversee programs that mentor youth interested in STEM careers. In the United States, there is a growing demand to build the talent capacity of skilled STEM workers (Center for Benefit-Cost-Studies of Education 2006; United States Department of Labor [USDOL] 2007; Alliance for Science and Technology Research in America 2010; Brody n.d.). This demand heightens the need for educational and community leaders to be prepared to implement career development programs with fidelity. This dissertation also provides direction for aligning the design of STEM career development programming with its implementation so fidelity can be achieved.

This study demonstrates how individuals and advocacy groups with an interest in state and local policy processes can draft a plan of action to address a major public policy issue – historic underrepresentation of ethnic minorities in STEM careers. There may be varying degrees that mark how the design of a program aligns with how the program is implemented (Smith and Larimer 2009). Barriers may be encountered during policy implementation that alter programming such as problems experienced by the program’s
administrators and participants (Vergari 2005). This dissertation serves as a model of how a plan of action served as the cornerstone of program implementation, guiding program directives for decades. In addition, this work showcases the process whereby policy assumptions, embedded in the program design, inform decisions about STEM career development programs for underrepresented youth.

This dissertation also provides a detailed account of how state and local leadership make decisions about how to manage staff expertise and time – decisions that can expand opportunities for collaboration between the K-12 and post-secondary sectors. The study’s findings have profound implications for administrators, school leaders, and others who seek to build program capacity to support youth in the K-16 educational pipeline (Lawson 2010). The findings offer guidance to providers who restructure and connect services for youth with seemingly insurmountable academic, behavioral and/or social barriers.

The original research for this dissertation includes document analysis and in-depth interviews. In addition to collecting and analyzing official STEP documents, 21 in-depth interviews were conducted with state and local STEP officials. The data collected for this comparative case study contains rich, behind-the-scenes information – archival information that is not readily accessible through standard public access but was made available during the interviews with state and local STEP administrators. During those interviews, candid reflections on the strengths and weaknesses of STEP implementation were shared. Each interview was informative and yielded comparative data. The study carefully examines the New York State STEP initiative as originally designed and the
extent to which implementation aligns with the program as designed. The research uncovered key facts and dynamics pertaining to STEP’s design and implementation.

The study is a process evaluation of programming provided by New York State’s STEP (Vergari 2005). Rather than an outcomes evaluation, the study is a process evaluation of four STEP sites “aimed at discovering whether a policy or program is operating as originally planned” (Vergari 2005, 179). It reveals the extent to which the program implementation processes at the four STEP sites are aligned with the original program design – and the design avowed by current NYSED administrators – and why or why not.

Sixty STEP sites were funded at the time of this study or the first year of the 2011-2015 grant cycle. Of these, a purposive sample of four sites was selected for the dissertation research: two located in upstate New York and two located in downstate New York. Of the two STEP sites located in upstate New York, one was sponsored by a private post-secondary institution. The other site operated on the campus of a public post-secondary institution. The two STEP sites in downstate New York also differed in that one was sponsored by a private university, while the other STEP site operated under the auspices of a public university.

All four case study sites – Sites A, B, C, and D – were recipients of STEP grants for at least 20 years. Each site also had at least one core staff person who had 10 or more years of experience implementing the program. The four STEP sites were also

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21 For the purposes of this study, the upstate area is defined as any part of New York State outside of the five boroughs of New York City: Brooklyn, the Bronx, Queens, Manhattan and Staten Island. The downstate area is defined by the five boroughs.

22 Studying implementation of programs that have been in operation for at least 10 years tends to yield more reliable and valid findings (Kirst and Jung 1980). A focus on examining short-term implementation of programs can magnify occurrences of failures.
selected because they were sponsored by a post-secondary institution that offered STEM college majors.

The interviewees included a former NYSED administrator who was one of the architects of the Regents’ Action Paper (NYSED 1984). This interviewee provided useful information on the historical context of the drafting of STEP’s original program design. The additional interviewees were three NYSED administrators who were currently managing STEP and 17 local STEP administrators.

This study focused on data from STEP in its 2011-2012 program year and programs serving students in grades 7-12. The research findings on STEP's design demonstrate how individual policy actors within institutions – governmental, educational, and community – can reach consensus on a major public policy issue (Smith and Larimer 2009). These policy actors not only reached consensus but also drafted and enacted a clear, systematic plan – the Regents’ Action Paper and STEP legislation (NYSED 1984; New York State Senate 1985a). This plan outlined how to increase and provide long-term support for historically underrepresented ethnic minorities in STEM careers. Overall, all four case-study programs were well-aligned with the original plan. During interview discussions, local administrators were well acquainted with the policy assumptions and original program design of STEP – referencing them often as interviewees discussed why policy decisions were made.

On the pages that follow is a discussion of five sets of significant research findings regarding STEP’s (1) policy assumptions, (2) program design, (3) curriculum, (4) operational issues, and (5) recruitment activities that supported alignment of the program with the program design.
(I) Significant Research Findings: Policy Assumptions

There are two significant findings in this study regarding the assumptions made by STEP’s policymakers. The first finding is that the Action Paper also includes data supporting the Regents' policy assumptions about the historical underrepresentation of Black/African-American, Hispanic/Latino and American Indian/Alaskan Native students. For example, tables of student participation rates from high school through graduate school and post-secondary degrees conferred by race demonstrated low high school graduation rates in 1983: 12.3% for Blacks/African-Americans; 6.7% for Hispanics/Latinos; 1.8% for American Indian/Alaskan Native students, and 79% for Whites (NYSED 1984).23

The tables in the Regents’ Action Paper also provide evidence of underrepresentation of ethnic minorities at the post-secondary level. For example, one table indicates that 7.8% and 3.9% of all bachelor’s degrees were conferred to Blacks/African-Americans and Hispanics/Latinos, respectively, in 1981. These rates generally decreased through graduate school, with 5% and 2% of doctoral degrees conferred to Blacks/African-Americans and Hispanics/Latinos, respectively. Data from the 1980 United States Census indicated that 11.52% of the population at that time identified as Black and 6.45% of census completers were Hispanic (United States Census [2000] 2013). These statistics accented the need for the Regents’ plan for action.

The Action Paper also includes recommendations and action strategies at all levels of education, from pre-school through graduate school and professional education. These recommendations and strategies are described as benefitting not only

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23 See Table 4.16 and Appendix F for additional data regarding STEM doctorate recipients by race or ethnicity in 2011.
underrepresented minorities, but the “educational system as a whole and society at large” (NYSED 1984, 6). When more historically underrepresented minorities have access to STEM fields, society benefits from an increase in the pool of talented licensed professions (Jackson 2007; Office of Naval Research 2011; Zacks Investment Research 2011). This societal argument helped to cultivate widespread support for the STEP initiative. The need for the creation of STEP was not to be viewed as one that only impacted ethnic minorities.

To substantiate this argument, the Action Paper draws attention to the underrepresentation of ethnic minorities in the STEM fields as not only a vital social and moral issue, but also a critical economic concern. The Regents identified concerns at the national and state levels including how underrepresentation reduces the likelihood of students completing high school and entering graduate or professional education. They argued that this will lead to untapped human resources to deal with complex global problems. There will be less people with advanced training in the talent pool to address issues of environmental pollution, adequate food supplies, rapid technological change, and international conflict.

The Regents also pointed out the impact of underrepresentation of ethnic minorities on New York’s economy, predicting that the number of “college age” minorities in the 16-24 year-old cohort would require support and services that would place a burden on taxpayers (NYSED 1984, 3). The Regents’ assertion that it would benefit all of society if ethnic minorities had support to gain access to the licensed professions before barriers impeded underrepresented youth from doing so, helped to
garner widespread support for the plans outlined in the Action Paper.\textsuperscript{24} By increasing minority participation at all educational and occupational levels, persons of every ethnic background would benefit as each citizen makes societal contributions.

A second significant finding regarding policy assumptions that guide STEP is that the components of the problems outlined in the Action Paper reflected the four areas of research that guided this study: career, self-concept, social capital, and policy implementation studies. The Regents asserted that career barriers include inadequate K-12 school counseling and insufficient steps to promote student retention through planning how to best transition from one academic level to another. These career barriers were thought to contribute to a lack of student aspiration and low expectations.

The Regents also concluded that underrepresented students had limited access to important social capital resources and that this deficit needed to be addressed. Social capital resources in this context include adequate training in fundamental skills, access to special help, and viable plans to retain students in school. At the policy implementation level, the Regents found that there were inflexible or insensitive student admissions procedures at the college level, a lack of funding to increase minority access to the licensed professions, and little institutional commitment to affirmative action.

The Regents also asserted in the Action Paper that historically underrepresented youth in STEM careers are often limited in their awareness of options to pursue careers in the licensed professions. To reverse this trend of underrepresentation, the Action Paper recommends STEP policies that would maintain and improve the quality of the following core program activities: academic preparation, supervised research, college admissions counseling and assistance with the college application process, standardized test

\textsuperscript{24} Face to face interview with government official, January 2012.
preparation, career development activities, and summer programming (NYSED 1984; NYSED 2012a).

(II) Significant Research Findings: The State’s Role and the Program Design

Program design. The Regents’ Action Paper clearly defined the mission for STEP: to increase the numbers of Black/African-American, Hispanic/Latino, and American Indian/Alaskan Native students interested in STEM-related careers (NYSED 1984). STEP was designed to provide educational, social, fiscal and statutory support for students from these ethnic groups who have been historically underrepresented in STEM fields (Jackson 2007; NSF 2012; Zweben and Bizot 2012). The Action Paper demonstrated a marshaling of policy resources by local and state stakeholders during the 1970s and 1980s to address STEP’s mission (Smith and Larimer 2009). (See Figure 5.1.)

A second significant finding regarding the State’s role is that the agenda-setting process for drafting the STEP legislation strengthened implementation of the program design (Smith and Larimer 2009). There were a number of activities that preceded Governor Mario Cuomo signing Senate Bill 960 – the STEP legislation – into law on April 16, 1985 (New York State Senate 1985a; NYSED 2012a). These agenda-setting activities centered around increasing minority access to the licensed professions.25 A number of government, educational, and community stakeholders contributed to the policy design of STEP:

25 See Appendix E for the list of professional careers or professions that are licensed, registered or certified by the Regents.
In 1972 the Regents drafted “Minority Access to and Participation in Post-secondary Education.” In the statement, the Regents invited all post-secondary institutions to “state their goals for integration and to develop programs of affirmative action to realize these goals” (NYSED 1984, 1).

From 1980-1981, regional conferences that involved more than 1,500 representatives of institutions, boards and other groups contributed to the dialogue on how to address underrepresentation (NYSED 1984).

On June 12, 1981, the New York State Assembly’s Higher Education Committee, the Black and Puerto Rican Legislative Caucus (currently named the Black, Puerto Rican, Hispanic and Asian Legislative Caucus), and New York University co-sponsored an invitational conference. Invitational conference attendees included 150 stakeholders representing “all levels of education, professional boards and societies, community
and commercial organizations as well as agency and legislative staff” (NYSED 1984, 1).

According to one of the architects of the Regents’ Action Paper no program like STEP pre-existed. Although there was no model from which to create STEP, there was substantial consensus on the need for such a program. It is rare in the public sector to have widespread agreement on what the goals should be to address a problem (Smith and Larimer 2009). The Regents’ Action Paper reflects the rare consensus that drove STEP’s policy design. The Action Paper clearly and systematically outlines the collective vision of government officials, educators and representatives from community-based organizations to attack the problem of historical underrepresentation of ethnic minorities in the licensed professions.

(III) Significant Research Findings: STEP’s Curriculum

The third set of significant findings pertains to the curriculum activities that the four STEP case study sites employed. Although local site administrators maintained the original program design, STEP program administrators were able to allocate funding for STEP program year 2011-2012 core programming activities based on their unique program needs. These activities included the academic preparation; college readiness; supervised research; college admissions counseling and assistance with the college application process of STEP students; and the participation of their parents.

Promoting academic preparation of STEP students. Site A chose to expend STEP grant monies on academic tutoring, while the other three case study sites leveraged community resources to provide similar services at little or no cost. Site B and Site D partnered with their students' school districts to offer free tutoring, while Site C enlisted
the services of a community-based organization to provide free tutoring to its STEP students.

**Promoting college readiness of STEP students.** Site A also differed from the other case study sites in how college readiness was defined. Site A used a college placement test as one of the program’s indicators of college readiness, while the staff of Sites B, C, and D described students completing rigorous college-level projects under the supervision of college professors. Site A interviewees expressed disappointment with their students’ ability to compete with other sites during STEP’s statewide student research conference and described plans to revisit how their students prepare for STEM competitions. This an example of the type of reflection and planning that staff at the local level described doing on a regular basis to ensure that they are implementing the program design in ways that most benefit the students.

**Supervised research of STEP students.** As discussed previously, Site A offered less advanced opportunities for student research. A second significant finding is that at Site A, students worked on research projects primarily with teachers rather than college professors. Site A interviewees reported plans to involve more post-secondary faculty in preparing for the statewide STEP student research conference. Site B’s students worked primarily with post-secondary faculty, but not in all cases. In contrast, Site C’s students worked exclusively with college professors and/or medical doctors on their human services or medical project submittals for STEP’s student research conference.

According to their 2011-2015 grant application, Site D placed juniors and seniors who

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26 One Site A administrator discussed plans to have students work with college professors on research projects.
outperformed other STEP participants into advanced workshops with secondary teachers who received training in molecular genetic techniques to complete their research.

Establishing substantive K-16 partnerships is Requirement 1 of the STEP 2011-2015 grant application. The findings from Site C, in particular, demonstrate that despite seemingly limited staff resources much can be accomplished to sustain STEP career development programming and maximize K-16 partnerships. Site C, the study site that served the smallest number of students, had only one full-time, year-round dedicated director. The director hired STEP graduates and partnered with a community-based organization to provide summer programming at no cost. Site C’s director also hired STEP graduates to coordinate its job-shadowing activities. These activities allowed Site C’s students to closely observe what medical doctors do in a typical day.

**College admissions counseling and assistance with the college application process.** A fourth significant finding is that all of the case study sites provided counseling and assistance with the college application process, either through enlisting the aid of STEP graduates, guest speakers in the STEM fields and mentors from community-based organizations, or a combination thereof. However, compared to the other sites, Site B took the most comprehensive approach to preparing its students to advocate for their chosen STEM high school course of study. First, Site B counseled students to be familiar with relevant educational requirements. Second, Site B’s staff taught their STEP students how to effectively communicate with school counselors who may prevent them from taking the most direct path to graduation. Having had this experience, Site B’s students will be more equipped to advocate for themselves at the post-secondary level where they may have even less counseling assistance.
**Parental participation.** Staff from three of the four study sites – Sites A, B, and C – indicated that increasing parental participation seemed to be an elusive goal. These sites developed programs that drew low attendance and/or little commitment from parents to become involved in planning STEP activities for their children. Sites B and C established parent advisory committees so that parents could partner directly with local administrative staff on STEP projects. Site B also mandated that parents attend at least one advisory meeting in the hope that if parents attended once they would see the value in returning. Site B’s parental attendance increased from 15% in program year 2010-2011 to 20% in program year 2011-2012.

Unlike the other sites, Site D had an active parent group that met at least monthly with staff from the secondary schools where their children attended. When parents met with staff, discussions were framed by a review of student data – academic averages, Regents grades, PSAT and SAT scores, students’ internships, and career interests from Site D’s comprehensive database.

Site D also had a parent coordinator whose primary role was to ensure active parent involvement in the pre-collegiate education provided to its STEP students. Site D’s secondary schools funded the parent coordinator position, allowing STEP grant funding to be used for other purposes. As part of Site D’s plan to increase parental involvement, staff will make available a free guide for parents that will be published in-house. It will include information about how parents can access STEP resources that place or keep their children on the appropriate STEM career path. These efforts of Site D, including having a full-time staff person in place to focus on maintaining active parent involvement and publishing a parent guide, are an example of leveraging resources at the
local level to address a persistent barrier. Local STEP administrators have the implementation flexibility to allocate resources in this creative manner as long as the program’s guidelines are being met.

**IV Significant Research Findings: STEP’s Operational Issues**

The fourth set of significant findings concern operational issues such as policy guidance offered to local administrators; discretion in allocating STEP resources; the physical location of STEP offices; and summer programming and funding challenges.

*Policy guidance.* Local STEP administrators had access to a number of resources that provided guidance on how to implement the original program design of STEP. NYSED provided STEP guidelines for local STEP administrators in its 2011-2015 grant proposal application. The STEP grant proposal had six requirements and three priorities that mirror the STEP legislation. As long as the requirements and priorities are addressed satisfactorily, NYSED views STEP sites as having demonstrated STEM career development programming for historically underrepresented ethnic minorities that is aligned with the STEP legislation.\(^{27}\) Supplemental materials also provided guidance to local administrators as they implemented the program’s design, such as the STEP Field Manual and STEP Operations Manual (NYSED 2012a, 2012c).

*Discretion in allocating resources.* Although STEP was established by state legislation based on policy recommendations in the Regents’ Action Paper, local programs enjoy discretion in allocating human and fiscal resources. For example, as part of the 2011-2015 grant application, local STEP administrators were required by NYSED to secure a minimum of 25% in matching funds from other sources such as private and

\(^{27}\) See Chapter 4 for a discussion of the six requirements and three priorities that are outlined in NYSED’s 2011-2015 grant proposal application.
other governmental contributors (NYSED 2010b). There are four additional significant findings regarding how each STEP site utilizes staff and the implementation flexibility they have to do so.

**Physical location.** Two of the sites, A and D, operated their STEP offices on the campuses of the secondary schools where they served their STEP students. This allowed the staff of these STEP sites to be better positioned to be informed of school district changes that may impact STEP. This close proximity of STEP and school staff also enabled planning adjustments to be made more quickly than if the STEP staff worked solely on its university’s campus.

**Summer programming and funding challenges.** Interviewees from all four of the study sites acknowledged being impacted by NYSED’s 2010 change in how STEP funding was released. Based on a directive from then State Comptroller Alan Hevesi, STEP sites were required to have state contracts approved in order to receive funding instead of simply receiving grants. The requirement of a state contract lengthened the approval process and release of STEP funding. Since 2010 it has been a rarity for the four study sites to receive state funding by July 1, when summer programming is expected to begin.

During program year 2011-2012, Site A discontinued summer STEP services and partnered with community-based organizations to run other summer programs. Site A’s STEP students who were eligible for the programming offered by the community-based organizations joined those programs for the summer. Site B chose not to offer summer programming. With support from their post-secondary institutions – one private and one public, respectively – Site C and Site D maintained their summer programming. As

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28 Face to face interview with government official, January 2012

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discussed previously, students completed job shadowing and/or clinical placements during that time. This is an example of the flexibility sites have to implement their programming. Site C and Site D found resources from sources other than STEP funding to provide sustained programming. This is what the architects of STEP envisioned for the program’s future: K-16 partnerships resulting in investments beyond what NYSED is able to allocate within a grant cycle.

(V) Significant Research Findings: STEP Recruitment – Day of Service Activities, Student Self-Identification, and Male Participation

This section discusses significant findings regarding the fifth and final set of significant findings. These findings describe (1) recruitment policies that potentially prevent eligible STEP students from participating and (2) NYSED’s priority to offer program services designed to improve recruitment and retention of historically underrepresented male participants at all targeted grade levels. The key findings in this section center around STEP’s Day of Service activities, the STEP student self-identification process, and STEP’s efforts to increase its male participation across the four case study sites.

Day of Service Activities. Requirement 6 of the 2011-2105 STEP grant proposal requires STEP sites to plan Day of Service activities to disseminate education and information about STEM careers to students who are not currently served by STEP (NYSED 2012e). The Day of Service policy was not part of the original program design; the initiative started in 2008. Students in grades 6-12 generally attend along with their parents and school counselors.

All sites participated in Day of Service activities and acknowledged the impact of the initiative to increase awareness of STEP services. However, one Site B administrator
expressed frustration with having to explain the advantages of STEP to a general audience. Having done so in the past prompted angry responses from parents who would like to enroll their children in STEP but cannot due to the eligibility requirements. Parents have yelled at staff, and one parent vowed to do whatever he could to end the program if his child could not participate in STEP. Site B’s staff have tried to appease disgruntled parents by offering them a list of other services for which their children may be eligible. This is an example of the policy implementation process revealing strengths and weaknesses regarding the same policy (Gerston 2010). While the Day of Service activities provide an opportunity to raise community awareness about STEP, an unforeseen disadvantage was the negative reaction from some parents.

The majority of responses from local administrators at the case study sites were positive regarding the merits of implementing Day of Service activities. Given this and diminished NYSED oversight capacity, providing additional program implementation guidance to STEP sites who may experience the unintentional consequence of eliciting disgruntled reactions from parents in the community may be a low priority for NYSED officials.

**Student self-identification.** STEP’s Field and Operations Manuals consistently affirm that economic disadvantage is the only eligibility requirement that necessitates supporting documentation for students of any race in the program. NYSED data indicated that in program year 2010-2011, 6% (256 out of 8,505 STEP students) who met this economic criterion participated in the program. For that same year, NYSED reported 90% (7,616 out of 8,505 youths) self-identified as being of African-American or Hispanic/Latino heritage.
When completing the application for the program, two of the four study sites experienced challenges with having potential STEP students comply with the recruitment policy. Site A had a number of students at one partnering school district who self-identified as biracial, defined as having one White and one African-American parent. In its 2011-2015 STEP grant proposal, Site A reported that the demographic population of the school district included 76% White, 13% African-American, 7% Asian-Pacific Islander, and 1% Native American. One local administrator shared that most if not all of the biracial students identified with their White mothers. These students were not economically disadvantaged and, therefore, risked missing an opportunity to be STEP students if they did not complete the STEP application to reflect their African-American heritage.

In what was viewed by Site A as a remedy, the STEP student application for program year 2011-2012 included the biracial category for the first time. Prospective biracial students had an option that reflected their ethnic heritage, and Site A’s staff no longer needed to counsel prospective students regarding what often led to sensitive conversations about how to perceive themselves ethnically. This is an example of NYSED instituting a policy implementation change that reflects the policy assumptions of the original program design.

There is no mention of biracial identification in the Regents’ Action Paper nor the STEP legislation (NYSED 1984; New York State Senate 1985a). Instead, references are made to “minorities” and “ethnic minorities.” It appears as if the stakeholders who set STEP’s agenda, created the policy design, and recommended strategies for action were
not focused on the phenotypical appearance of STEP students of African-American descent.

Site D also faced a challenge concerning student self-identification. Being one of the two case study sites in New York City, Site D recruited from a large pool of students who ethnically self-identified with the Caribbean islands from which they came. For example, these students often refused to mark “African-American” on the STEP application because they identified as “Trinidadian” or “Guyanese.”

In keeping with the goal of extending access to STEP instead of limiting it, a Site D administrative representative described a current resolution to the problem. Students are counseled to add their Caribbean identities to the “Other” category on the student recruitment application. Staff also noted whether students were of African descent so eligible students did not get filtered out of the application process.

**STEP’s male participation.** There has been national concern regarding how the gender achievement gap has adversely impacted male college enrollment (Cornwell et al. 2013). This national concern is captured in Priority 1 of the STEP 2011-2015 grant proposal.

In program year 2011-2012, Sites A, B, C, and D reported a 46%, 44%, 38%, and 34%, male participation rate, respectively. (See Figure 5.2.) Site A’s higher percentage of male participants may be due to the site having a male core staff member who is actively involved in student recruitment; he is also a member of an ethnic minority targeted by STEP for increased representation in the STEM fields. Having this male staff member actively recruit eligible students is consistent with STEP’s goal to expose STEP students to mentors with the same ethnic background.
While Sites A, B, and C planned to offer an array of activities targeted to increase male participation, such as creating focus groups and enlisting the aid of male mentors, Site D had the most strategic response to Priority 1. Site D partnered with a community-based organization that has studied the issue of male underrepresentation longer. This has led to a three-phase approach which started with professional development of personnel. Next steps include workshops for parents and students and working with the STEP/C-STEP regional committee to develop strategies. Similar to Site D’s response to the need to promote active parental involvement, this is another example of Site D enlisting the aid of community-based resources – at no cost – to strategically identify how to address a long-standing public policy problem.

**Figure 5.2. Percentage of STEP Males and Females: Program Year 2011-2012**

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<thead>
<tr>
<th>Site</th>
<th>Males</th>
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<td>Site B</td>
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<td>Site D</td>
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**Limitations of the Study**

As discussed in Chapter 3, an examination of outcomes that resulted from STEP’s policy implementation practices was beyond the scope of this study. Instead, the study’s interview data were based on self-reported perceptions and reflections of the participating STEP staff.
Throughout the interviews with the administrators, comments were made about the collegiality and cohesive bonds of the administrators, both at and among the local and state levels. Many of the administrators who were interviewed have been involved with STEP for more than a decade, developing effective working relationships. Although interviewees were assured that what they shared about STEP would remain confidential, comments from administrators may have been curtailed to safeguard professional relationships. Administrators may have also filtered their comments due to fears that the study might focus on evaluating outcomes. To allay these fears, letters inviting the administrators to participate and subsequent discussions about logistical arrangements for interviews highlighted that the study would be a process evaluation. Interview questions would center around the process whereby STEP’s program design is implemented.

In order to assure confidence in the accuracy of the statements and protocols in place to maintain confidentiality, each interviewee was told beforehand that he or she would be e-mailed a draft transcript of the completed interview. Draft transcripts did not include any identifying information regarding interviewees, their secondary and post-secondary schools, or colleagues. Although each interviewee was asked to respond via e-mail with suggested changes to the draft transcripts, they may still not have felt comfortable being candid.

Although there were potential limitations, this careful case study approach uncovered complex dynamics that emerge as public policy becomes practice (Creswell 2009). Equally important, the study yielded compelling recommendations for educators, administrators of STEM career development programming, and others who serve youth with multiple career and social barriers.
Recommendations for STEM Career Development Programming and Future Research

This study has shown that the programs that were the subject of this case study research were generally faithful to the original program design. While there were key differences across the sites, cross-sector partnerships were central to program implementation.

The NYSED requirement for local STEP administrators to secure a minimum of 25% in matching funds from non-STEP sources to implement programming encouraged the STEP sites’ K-16 partnerships. These matching funds included in-kind or financial contributions or a combination of both. By enlisting the support of non-STEP sources, the constituency that has a stake in STEP was broadened beyond the K-16 community. This type of non-STEP, community engagement is what the Regents intended as part of their original program design. When seeking to replicate career development programming for historically underrepresented ethnic minorities, extending stakeholder buy-in beyond the educational community is essential. When other entities such as community-based organizations are engaged in STEP, it expands the range of interests that are directly committed to ensuring that all citizens – regardless of race, ethnicity, gender, or economic status – realize their career goals and potential to help address societal challenges.

Effective administrative leaders realize the importance of broadening the constituency base for career development programming. Those who establish career development programs should seek to develop diverse partnerships. These K-16 partnerships, and those that involve entities outside of the educational community, should better enable them to attend to the duties they have as well as to the people they serve and
the colleagues who allow them to do a job well done (Graffy 2013). This leadership style encourages access to information and other resources that can be invaluable as key stakeholders transition to other organizations and policies that impact programming are altered. The study confirmed that the physical location of the work environment can be an important factor in aligning a program’s implementation with its program design (Lane and Brown II 2004). The case study sites that had their STEP offices on the campuses of the schools where their STEP students learned were able to develop and sustain working relationships with school district and community-based partners, despite transitions in the work environment.

These working relationships made coordinating STEP services and advocating for the program easier. If they have not already made plans to do so, administrators of STEM career development programming should consider ways that they can develop these types of working relationships. For example, plans can be made to share office space – cutting program costs for all. Serving on the same community boards and meeting with school district partners on a regular basis to be informed of changes that may impact program needs will also be key. (See Appendix I, Perkins 2011, for additional guidance on effective working relationships from a top United States Department of Education official and National Aeronautics and Space Administration administrator.)

Future research should include a larger sample of STEP sites so comparisons across all of the existing ones can be made. Questions remain that can inform future STEM career development programming: Are there particular parental incentives that work better than others? Which policies are in place to support effective parental
incentives? Are there any sites that have more male than female participation? How do sites with greater percentages of male participants, like Site A, recruit and retain those students? Do these sites also have a core male staff member whose ethnic heritage mirrors that of the historically underrepresented students targeted for the program?

The study supports prior studies showing that it is critical to have policies in place that increase access to appropriate and individualized school counseling (Parsons 1909; NYSED 1984; Wagner 1999). This is particularly true of historically underrepresented youth in STEM careers. Are there other STEP sites, like Site B, that focus on equipping its students with knowledge about what courses they must take and the communication skills needed to effectively advocate to alter school schedules when needed?

Do all of the other sites manage to offer full-year programming and summer internships for STEP students despite funding lags? Is Site C’s administrative structure an anomaly? Or are there other STEP sites with one core, full-time director that manage to implement programming so that STEP services continue through the summer with job-shadowing placements for its students? If these other STEP sites exist, how do they leverage the resources they have to implement STEP’s program design regarding exposing students to these educational opportunities?

The study supports prior research on the importance of parents and school staff having access to quality career development information in middle and high school (Rosenbaum 2001; Creamer et al. 2007). Having this information will allow these stakeholders in the educational process to better guide historically underrepresented youth in their career plans. Future study of additional STEP sites will uncover whether there are sites, like Site D, that have managed to support a database of students’ academic
performance and career interests. These should be secure databases but also ones that are readily accessible to parents and staff alike.

The unique policy implementation challenges and successes STEP sites have regarding increasing parent partnerships, addressing the gender achievement gap, and sustaining programming can inform how educational leaders and administrators of STEM career development programming fortify the educational pipeline. Having this additional information about a nationally recognized program that has specialized in serving historically underrepresented ethnic minorities for more than 25 years will yield additional guidance regarding how to design and implement public policy.
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Association for Program Directors of STEP and C-STEP (APACS). 2009. Video. APACS Inc. presents: Impact: STEP and C-STEP.


Bayer Facts of Science Education. 2010. Executive summary: Bayer facts of science education XIV female and minority chemists and chemical engineers speak about diversity and underrepresentation in STEM. Pittsburgh, PA: Bayer Corporation.


## Table 2: Eligibility Requirements and Funding for Career Development Programs

<table>
<thead>
<tr>
<th>Fiscal Year (FY) Grants Awarded</th>
<th>GEAR UP</th>
<th>TALENT SEARCH</th>
<th>Upward Bound Math Science (UBMS)</th>
<th>STEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible Applicants</td>
<td>Governor-designated state agencies; “partnerships consisting of one or more local educational agencies &amp; one or more degree-granting institutions of higher education &amp; not less than two other community organizations or other entities such as businesses, professional organizations, or state agencies” (USDOE 2011c).</td>
<td>“Institutions of higher education, public &amp; private agencies &amp; organizations with experience in serving disadvantaged youth, combinations of such institutions, agencies &amp; organizations, &amp; as appropriate to the purposes of the program, secondary schools” (USDOE 2011e).</td>
<td>“Institutions of higher education, public &amp; private agencies &amp; organizations with experience in serving disadvantaged youth, combinations of such institutions, agencies &amp; organizations, &amp; as appropriate to the purposes of the program, secondary schools” (USDOE 2011f).</td>
<td>Institutions of higher education (IHE) “with registered scientific, technical, or health-related professional or pre-professional programs that lead to professional licensure or to employment in scientific, technical, &amp; health-related fields” (NYSED 2011); “IHE's administer projects in schools/school districts with 20% or more enrollment of historically underrepresented students” (NYSED 2010b).</td>
</tr>
<tr>
<td>Funding FY 2011 (FY 2010)</td>
<td>The last grant competition was conducted in FY 2008 (USDOE 2011a). (FY 2010: 211 awards were given totaling $323.2 million) (USDOE 2011a).</td>
<td>November 3, 2010 was the deadline for FY 2011 awards (USDOE 2011c). (FY 2010: $141.6 million was awarded to 463 projects) (USDOE 2011c).</td>
<td>$34.9 million among 50-54 grantees for one year (FY 2010: $34.9 million was awarded to 131 projects) (USDOL 2011g).</td>
<td>February 4, 2011 was the deadline for FY 2011 awards (NYSED 2010b). (FY 2010: $9.7 million was awarded to 50 projects.)</td>
</tr>
</tbody>
</table>

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29 This row includes the fiscal year each grant was first awarded or the program's founding year.

189
<table>
<thead>
<tr>
<th></th>
<th>GEAR UP (continued)</th>
<th>TALENT SEARCH (continued)</th>
<th>UBMS (continued)</th>
<th>STEP (continued)</th>
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<tbody>
<tr>
<td><strong>Matching/ Cost- sharing</strong></td>
<td>Grantee partners (non-Federal) may propose no more than 50% &amp; not less than 30% of matching funds (USDOE 2011a).</td>
<td>No matching or cost-sharing requirements (USDOE 2011c).</td>
<td>No matching or cost-sharing requirements (USDOE 2006).</td>
<td>A minimum of 25% in matching funds from other sources (2010b).</td>
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<tr>
<td><strong>Students Served</strong></td>
<td>“Middle &amp; high school students, beginning no later than the seventh grade; the cohort is followed through high school” (USDOE 2011d).</td>
<td>“…between the ages of 11 &amp; 27 who have completed the fifth grade. Two-thirds of students must have low income &amp; be potential first-generation college students” (USDOE 2011f).</td>
<td>“…completed the eighth grade. Two-thirds of all participants must have low income levels, first-generation college students” (USDOE 2011f).</td>
<td>In NYS; enrolled in grades 7-12. Participants must be economically disadvantaged, or Black, Latino, &amp; other underrepresented ethnic minorities (NYSED 2010b).</td>
</tr>
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</table>
APPENDIX B

Interview Questions for State Administrators

“Thank you for setting aside time to meet with me. I would like to begin by asking you about some basics of the program. . .”

1. When did the program begin?

2. How long have you been involved in the program?

3. What are the main purposes of the program?
   3a. Are these purposes in official written form? [formal purposes] Are there any purposes of the program that are not formally written down but understood by administrators as objectives of the program? [informal purposes]

4. Are the purposes at the local STEP sites the same as your state-level objectives?

“Next, I want to ask you questions about how the program is actually being implemented at the state level and by the local sites. . .”

5. Is there a formal, written set of guidelines for implementing STEP?
   5a. What are the guidelines followed by your office?

6. Are there informal practices that shape implementation of STEP? If so, can you provide any examples? [Note: For example, an informal way of doing things that has evolved over time to be standard practice.]

7. What are some examples of how the STEP sites have carried out the State’s goals for the program?

8. What are some examples of STEP initiatives that have resulted in outcomes that were different than what the State expected?

9. What have been the main challenges of implementing STEP? Please discuss challenges encountered in your office and challenges that you may be aware of at the STEP sites. [Note: If interviewee asks for clarification, examples might include capacity issues such as financial resources, training, and will issues such as morale and motivation. Communication might be another issue.]

10. Have there been any key changes to the program over time? If so, what are these and how and why were these changes made?

11. If you think about both the original purposes and the actual implementation of STEP, what are the main strengths of the program at the state level?
11a. What are the main weaknesses of the program at the state level?

12. What are the strengths and weaknesses of the program at the STEP sites?

"Now I have just a few more questions. I'd like to ask you about possible improvements to the program..."

13. Are there any changes that you think should be made to STEP – at the state level, local sites, or both? Why?

14. If you were able to make up to three major changes to STEP, would you do so? If so, what would they be?

15. In conclusion, is there anything else about STEP and how it is being implemented that you would like to share?
Interview Questions for Program Site Administrators

“Thank you for setting aside time to meet with me. I would like to begin by asking you about some basics of the program...”

1. When did your STEP begin?

2. How long have you been involved in the program?

3. What are the main purposes of the program?
   3a. Are these purposes in official written form? [formal purposes] Are there any purposes of the program that are not formally written down but understood by administrators as objectives of the program? [informal purposes]

4. Are the purposes at the state level the same as your local site-level objectives for the program?

“Next, I want to ask you questions about how the program is actually being implemented by your local site and at the state level...”

5. Is there a formal, written set of guidelines for implementing STEP?
   5a. What are the guidelines followed by your office?

6. Are there informal practices that shape how your office implements STEP? If so, can you provide any examples? [Note: For example, an informal way of doing things that has evolved over time to be standard practice.]

7. What are some examples of initiatives at the state level that help your STEP site to carry out the State’s objectives for the program?

8. What are some examples of STEP initiatives at your site that have resulted in outcomes that were different than what the State expected?

9. What have been the main challenges of implementing STEP? Please discuss challenges encountered in your office and challenges that you may be aware of at the state level. [Note: If interviewee asks for clarification, examples might include capacity issues such as financial resources, training, and will issues such as morale and motivation. Communication might be another issue.]

10. Have there been any key changes to the program over time? If so, what are these and how and why were these changes made?

11. If you think about both the original purposes and the actual implementation of STEP, what are the main strengths of the program at the state level?
11a. What are the main weaknesses of the program at the state level?

12. What are the strengths and weaknesses of the program at your own site?

“Now I have just a few more questions. I'd like to ask you about possible improvements to the program. . .”

13. Are there any changes that you think should be made to STEP – at the state level, your local site, or both? Why?

14. If you were able to make up to three major changes to STEP, would you do so? If so, what would they be?

15. In conclusion, is there anything else about STEP and how it is being implemented that you would like to share?
## Draft List of Proposed STEP Sites for the Study

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<tr>
<th>STEP Sites in Downstate New York</th>
<th>STEP Sites in Upstate New York</th>
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</thead>
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<tr>
<td><strong>Private</strong></td>
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<tr>
<td>3. New York University – School of Medicine, New York, NY</td>
<td>4. Rochester Institute of Technology, Rochester, NY</td>
</tr>
<tr>
<td>5. Columbia University – College of Dental Medicine, New York, NY</td>
<td>6. Syracuse University, Syracuse, NY</td>
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<tr>
<td><strong>Public</strong></td>
<td></td>
</tr>
<tr>
<td>1. CUNY John Jay College of Criminal Justice, New York, NY</td>
<td>2. University of Rochester – School of Medicine and Dentistry, Rochester, NY</td>
</tr>
<tr>
<td>3. CUNY City College of New York – School of Engineering, New York, NY</td>
<td>4. SUNY University at Buffalo, Buffalo, NY</td>
</tr>
<tr>
<td>5. CUNY New York City College of Technology, Brooklyn, NY</td>
<td>6. SUNY New Paltz, New Paltz, NY</td>
</tr>
<tr>
<td>7. CUNY Medgar Evers College/Jackie Robinson, Brooklyn, NY</td>
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## APPENDIX D

### Primary Actors Listed in Regents’ Action Paper

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<tr>
<th>Regents of the University</th>
<th>Location</th>
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<tr>
<td>Martin C. Barell, Vice Chancellor, B.A., I.A., LL.B., LL.D.</td>
<td>Muttontown</td>
</tr>
<tr>
<td>Kenneth B. Clark, A.B., M.S., Ph.D., LL.D., L.H.D., D.Sc.</td>
<td>Hastings on Hudson</td>
</tr>
<tr>
<td>Emlyn Griffith, A.B., J.D.</td>
<td>Rome</td>
</tr>
<tr>
<td>Jorge L. Batista, B.A., J.D., LL.D.</td>
<td>Bronx</td>
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<tr>
<td>Laura Bradley Chodos, B.A., M.A.</td>
<td>Vischer Ferry</td>
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<tr>
<td>Louise P. Matteoni, B.A., LL.B., L.H.D.</td>
<td>Bayside</td>
</tr>
<tr>
<td>J. Edward Meyer, B.A., LL.B., L.H.D.</td>
<td>Chappaqua</td>
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<tr>
<td>R. Carlos Carballada, B.S., L.H.D</td>
<td>Rochester</td>
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<tr>
<td>Floyd S. Linton, A.B., M.A., M.P.A., D.C.L.</td>
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<tr>
<td>Salvatore J. Sclafani, B.S., M.D.</td>
<td>Staten Island</td>
</tr>
<tr>
<td>Mimi Lieber, B.A., M.A.</td>
<td>Manhattan</td>
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<tr>
<td>Shirley C. Brown, B.A., M.A., Ph.D.</td>
<td>Albany</td>
</tr>
<tr>
<td>Robert M. Best, B.S.</td>
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<tr>
<td>Norma Gluck, B.A., M.S.W.</td>
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</tr>
<tr>
<td>Thomas R. Frey, A.B., LL.B.</td>
<td>Rochester</td>
</tr>
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### NYSED Staff

- Gordon M. Ambach, President of The University and Commissioner of Education
- Robert J. Maurer, Executive Deputy Commissioner of Education
- Donald J. Nolan, Deputy Commissioner for Higher and Professional Education
- Frank C. Abbott, Assistant Commissioner for the Professions
- Daniel W. Szetela, Coordinator of Professional Education Services
- Arthur L. Walton, Jr., Minority Professional Education Coordinator

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30 The Regents are listed as they appear in the Action Paper.
APPENDIX E

List of Professions Licensed, Registered, or Certified by the NYS Board of Regents

1. Acupuncture
2. Architecture
3. Athletic Training
4. Audiology
5. Certified Shorthand Reporting
6. Chiropractic
7. Clinical Laboratory Technology
   - Clinical Laboratory Technologists
   - Cytotechnologists
   - Clinical Laboratory Technicians
   - Certified Histological Technicians
8. Dentistry
   - Dentists
   - Dental Anesthesia/Sedation
   - Dental Hygienists
   - Certified Dental Assistants
9. Dietetics-Nutrition
10. Engineering
11. Interior Design
12. Land Surveying
13. Landscape Architecture
14. Massage Therapy
15. Medical Physics
16. Medicine
   - Physicians
   - Physician Assistants
   - Specialist Assistants
17. Mental Health Practitioners
   - Creative Arts Therapists
   - Marriage and Family Therapists
   - Mental Health Counselors
   - Psychoanalysts
18. Midwifery
19. Nursing
   - Registered Professional Nurses
   - Nurse Practitioners
   - Licensed Practical Nurses
20. Occupational Therapy
   - Occupational Therapists
   - Occupational Therapy Assistants
21. Ophthalmic Dispensing
22. Optometry
23. Pharmacy
   - Pharmacists
   - Pharmacy Establishments
24. Physical Therapy
   - Physical Therapists
   - Physical Therapist Assistants
25. Podiatry
26. Polysomnographic Technology
27. Psychology
28. Public Accountancy
   - Certified Public Accountants
   - Public Accountants
29. Respiratory Therapy
   - Respiratory Therapists
   - Respiratory Therapy Technicians
30. Social Work
   - Licensed Master Social Worker (LMSW)
   - Licensed Clinical Social Worker (LCSW)
31. Speech-Language Pathology
32. Veterinary Medicine
   - Veterinarian
   - Veterinary Technician
### APPENDIX F

<table>
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D = suppressed to avoid disclosure of confidential information.

1 In most cases, non-U.S. American Indians are citizens of Canada or of a Latin American country.
2 Excludes Native Hawaiians or Other Pacific Islanders who are not Hispanic.
3 Includes persons reporting Hispanic ethnicity, whether singly or in combination with one or more races.
4 Includes doctorate recipients who are not Hispanic and do not indicate race, doctorate recipients with unknown race and ethnicity, and Native Hawaiians or Other Pacific Islanders who are not Hispanic.


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31 Table 19 is reprinted with permission from the Project Officer for the National Science Foundation’s Human Resources Statistics Program.
School systems, including the educational leaders that serve in them, have an extraordinary opportunity to impact the lives of students, family members, and the surrounding community. In order to make the most meaningful impact, school staff must forge successful partnerships with parents. Parents are often overwhelmed by life circumstances and are in dire need of responsive and caring guidance as they seek the best educational outcomes for their children (Briar-Lawson et al. 1998). These outcomes for their children include equipping youth with the ability to realize academic success as well as personal growth. Parents want their children to develop into mature individuals who are able to make positive contributions to their community.

All parents want their children to succeed. Parents depend on educational leaders to give them the assistance they need to make this happen. Finding ways to partner with parents, particularly those who feel isolated, should be an integral part of any educational leader’s school improvement plan to provide comprehensive learning supports. These collaborative relationships increase the likelihood of school systems being able to engage students and their parents in responsive and substantive ways.

32 Amendments to “Making Connections: Principals’ Leadership for a Comprehensive System of Learning Supports” include recommended changes by Professor Lawson, and the fictionalization of the school and community-based organizations named.
Effective educational leaders realize that all parents, including those who seemingly isolate themselves from school functions, are looking for ways to advocate for their children. Successful educators are able to proactively engage and involve all parents in ways that allow for effective advocacy. Successful principals realize that building staff capacity to partner with parents should be a school improvement priority and practice.

Educational leaders should be adept at empowering school staff to proactively collaborate with parents. The distributed leadership model can cultivate this type of staff empowerment. School staff members who follow a distributed leadership model do whatever is necessary to support learning, even if it means completing a task that is not traditionally part of their job description.

*Substantively collaborating with parents is a necessity.* An end result of school-parent collaborations should be a harnessing of parental willingness to advocate for their students as well as other family, school, and community resources in comprehensive and strategic ways. In order to highlight researched best practices and recommended strategies for creating and enhancing comprehensive systems of learning supports, the paper will largely draw on the expertise of Hal Lawson, Richard Elmore, Anne Henderson, Karen Mapp, Vivian Johnson, and Don Davies as well as that of Dawn Anderson-Butcher, Jerry Bean, Barbara Boone, and Amber Kwiatkowski, et al.

**Findings: First Two Assignments**

As a class requirement, we were asked to complete a synopsis of findings from a school partnerships’ inventory and an overview of what effective youth development
programming entails. Conclusions based on the first two assignments underscore the importance of finding ways to provide more streamlined, comprehensive services. Strategic planning that maximizes how community resources are used should be the foundation of any student support initiative.

**School partnerships’ inventory.** During face to face interviews, four core staff members from Inner City Elementary School were asked questions from the Adelman and Taylor (2007) Inventory. The inventory is a tool that leads schools in a self-study of resource-oriented activities that are offered in the school environment. There are over 40 pages of inventory questions that prompt staff to consider how effective the school’s resources are. The survey also helps staff to examine, redesign, and enhance the structures in place at the school to support learning.

The staff members who completed the survey included an interim principal, home school coordinator, social worker, and a retired social service administrator who coordinated activities in the school’s Family Resource Center. When the survey was conducted, the school was transitioning from having five different principals from 2005 to 2009. The elementary school was also undergoing major construction to the physical plant of the building.

Some of the staff involved in completing questions as part of the inventory reported that reflecting on their responses yielded benefits. Responding to the survey questions gave them another impetus to discuss ways to enhance communication and collaborate on meeting instructional goals more effectively. This enhanced

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33 Names of schools, staff, and any other personally identifying characteristics have been fictionalized to maintain the confidentiality of participants.
34 The school’s Family Resource Center is funded by support from the Inner City County Youth Bureau. The Family Resource Center has computers as well as reading and counseling areas in the center for parent and student use.
communication and collaboration occurred even in the midst of the major transitions they had been facing.

**Survey Findings**

*Stakeholders served: students and staff*

- Students who have a first language that is not English and who are not proficient in English and their family members; there are about 7% of the school’s students who are in this category. They are mostly refugees from places like Afghanistan, Burma, the Congo, Iran, and Iraq.

- Staff members and volunteers – Inner City Elementary School had approximately two administrative and 50 instructional staff (including teachers and paraprofessionals) as well as 15 volunteers working with the school’s students and families.

**Implications for a comprehensive system of learning supports**

- *Establish student and family outreach committees:* The interim principal planned to continue to lead the effort to organize newly formed committees. These committees would be responsible for drafting, maintaining, and implementing a formal training system that could support a distributed leadership model (Elmore 2000). When principals employ the distributed leadership model, they empower each person on the school staff – regardless of their titles or positions – to respond to instructional needs. Instruction is everyone’s responsibility.
It is expected that by using this model, teachers’ aids, volunteers and others would be better equipped to complete their instructional assignments. In turn, they would support the needs of children who attend the school and their family members more effectively.

♦ Utilize parents as paraprofessionals: Train parents who can speak the languages of the children to accompany staff on home visits (Anderson-Butcher et al. 2004, 7.13, 7.14; Henderson et al. 2007). These visits would be an opportunity to identify family needs as they persist and change. This would also be a chance to gather information about school assets and opportunities for support in the community that exist to meet these needs.

♦ Strengthen connections between school and home:
  
  • Plan Inner City Young Men’s Christian Association (YMCA) family preservation events, Inner City Police Athletic League (PAL) work fairs, and the content of school newsletters for parents and community members with an increased focus on improving mechanisms for communication.

    o Coordinate agendas and the dissemination of featured content in newsletters and parental memoranda. Strategically address how to support the needs of students who are often isolated and their parents. Isolated students include those whose first language is not English. For example, “Think about how newsletter articles could give parents better information about
what students are learning, how well they are doing and what parents can do to help them” (Henderson et al. 2007, 96).

- Arrange “transportation, child care and lined-up ‘surrogate parents’ for children whose parents could not come” (Henderson et al. 2007, 101).

- Hold school functions in more accessible areas where parents who do not typically participate live. Accessible areas could include recreation centers in local housing authorities and places of worship.

- Translate priority, if not all, paper and electronic correspondence in the languages of parents that seem to be the most isolated.

The survey responses from the leadership staff of Inner City Elementary School and the associated recommendations are consistent with research that emphasizes the importance of maximizing resources (Lawson 2007, 10). Maximized resources should include those that can be cultivated during out-of-school time.

Regularly reaching out to parents through translated newsletters and school functions hosted in their neighborhoods are proactive approaches. These approaches enable consistent communication with parents, instead of seeking parental input solely when crises arise (Anderson-Butcher et al. 2004, 7.8; Henderson et al. 2007). This regular contact can breed mutual trust and respect, resulting in social capital deposits that can render “relational dividends.” When parents or guardians are experiencing crises, and if they are accustomed to partnering well with school staff during pleasant or tranquil

35 Social capital resources are discussed in greater detail in Chapter 2 of the dissertation.
occasions, there is an increased likelihood that successful partnerships will be sustained during crises.

Maintaining “family friendly” communications throughout the calendar year is a more effective way to reach both parents in distress who seem to be isolated from accessing school resources as well as “low-risk and no-risk” families36 (Anderson-Butcher et al. 2004, 7.15). All benefit from educational leaders who lead staff to focus their efforts on ways to strengthen and expand partnerships between the school, home and the community. Identifying additional ways to develop youth outside of the classroom and within the students’ community is another research-supported common practice of principals seeking to offer comprehensive learning supports.

Overview of youth development programming best practices

Youth development programming. This type of programming refers to any activity that encourages student engagement beyond what typically occurs in academic classes. For example, involvement in programming sponsored by the YMCA or PAL would be included in this definition. The definition is a broad one, also featuring any activity that allows students to substantively participate in planning instructional or extra-curricular activities (Anderson-Butcher et al. 2004, 6.2).

Recommendations for Best Practices in Youth Development Programming

Youth engagement initiatives need to be structured so that they are results-oriented, logical, comprehensive, evaluation-driven as well as theoretically sound and research supported (Anderson-Butcher et al. 2004).

36 “Low-risk and no-risk” families are those who have access to abundant socio-economic resources.
1. Results-oriented – tailored to substantively and strategically address the needs of students, teachers, and family members that are served by the school. Using this approach increases the likelihood that gaps in services may be mitigated. Identifying whether youth development programs are “activity oriented versus results oriented” is an integral part of appropriately identifying expected results (Anderson-Butcher et al. 2004, 4.9).

2. Governed by logical planning – organic, non-linear and responsive so that the changing needs of stakeholders may be best addressed, as opposed to being static in its approach. If the needs of students and families warrant changes in policies and procedures, the best ways to make those changes are considered for action.

3. Marked by comprehensive strategies that are crafted to be varied enough to target “multiple systems (i.e., families, schools, communities and peers) and reinforce consistent messages across settings” (Anderson-Butcher et al. 2004, 4.3). These are strategies that include all or as many of the stakeholders who may be impacted by the services being offered.

4. Lastly, effective planning is strategically grounded in theory and research with next steps that are evaluation-driven.

*Anticipating barriers to successful design implementation.* Effective educational leaders:

1. Acknowledge that they cannot foresee all barriers to realizing intended programming results. However, they can manage their time so that plans for youth engagement will be guided by reflection and input from as many strategic partners as time allows.
2. Make every effort to provide clear and consistent communication of the strategies and activities that are part of the overall vision for school success. This effort produces more reflective, responsive, and comprehensive input from stakeholders engaged in planning.

3. Develop logic models. (See Appendix H for a sample logic model). Logic models provide visuals of conditions, inputs and underlying assumptions associated with youth development program planning. These models are effective ways to track school accomplishments and challenges (Anderson-Butcher et al. 2004; Henderson et al. 2007). Logic models prompt school staff, partnering parents, and community stakeholders to focus on program outcomes: “What did we do? How well did we do it? What difference have we made?” (Henderson et al. 2007, 290).

Findings: Other Readings, Class Discussions and Personal Experiences

Students. Youth development programming can provide opportunities for nurturing feelings of “connectedness” to the school environment. When students feel connected to school they do better academically and are less likely to be involved in risky health behaviors: “drug use, cigarette smoking, early sex, violence, and suicidal thoughts or attempts” (Blum 2005, 1).

School connectedness is marked by the following examples:

- “Having a sense of belonging and being part of a school;
- Liking school;
- Perceiving that teachers are supportive and caring;
- Having good friends within school and
- Participating in extracurricular activities” (Blum 2005, 1).
Parents. Effective leaders see the need to increase connections not only with youth but to substantively engage their parents. Federal legislation has provided Title I monetary support for increased parental involvement. However, “few school-based service integration initiatives fully build the abundance of power to which all stakeholders are entitled” (Briar-Lawson and Drews 1998, 52). Many school systems have missed an opportunity to use federal support to increase student opportunities for learning.

Schools. Elmore (2000) in “Building a New Structure for School Leadership” describes public school systems as being ill-equipped to respond to increasing demands they face under standards-based reform. Large-scale improvement of instruction is required. Such instructional reform is unlikely to be led by “visionary leaders [who] are recruited almost exclusively from the ranks of practice” (Elmore 2000, 2). Visionary leaders are more concerned with relaying the vision to the school community than having the needs of the community drive the vision.

Staff from the ranks of practice are usually chosen to function in leadership roles that require them to deal with seemingly permanent status quo mediocrity. Generally, staff from the ranks do not operate in ways that will modify instructional structures to expand comprehensive learning supports. It is almost inconceivable for visionary, educational leadership to conceive of more effective ways to provide instruction. Typical educational leaders from the ranks of practice are trained to focus on barriers and risks in the public school environment, instead of assets and opportunities for instructional excellence.
Implications for School Leaders

Educational leaders generally are not encouraged to identify ways to dismantle ineffective instructional structures. Instead, they are prompted to work within them – to manage levels of competence – because no other manner of functioning seems to be viable. A public school system that provides instructional leadership that truly benefits the students, parents, community stakeholders, and staff served is almost inconceivable to many educational leaders. Without new structures for instructional leadership, well-intentioned and committed educational leaders are rendered sterile or unproductive.

Utilize strategic interventions. These administrators want to see the staff and families they serve accomplish more, but they are unable to conceptualize how this can be done or even if this may happen. Unfortunately, they can often be characterized as an educational leadership operating without effective purpose. They are doing the best they can with school improvement practice mired in structures that they believe will never change. These instructional leaders have become so accustomed to working within the current structures in place to provide instruction that it is unlikely for them to envision reform without comprehensive, systemic and targeted interventions.

Without newly designed roles, responsibilities and relationships for educational leaders, “organizational ossification” is likely to be the result (Meyer 2002, 537). Public school principals will find themselves excelling at maintaining the status quo. As a result, instructional failure will be bred for many. To the contrary, the effective principal realizes opportunities exist to cultivate the best structural components of what is currently in place. Structural assets can be enhanced by steadily applying principles supported by research-based, evaluation-driven, best practices.
These best practices stress the importance of partnering with parents. Improving ways to build school structures that effectively support parents to partner with school staff is an area in which principals across public schools may need guidance. Staff often need practice mobilizing resources so they can substantively engage families.

How can principals effectively lead their staff? How can principals envision and implement practices in schools where instructional structures are in place to support active and substantive parental involvement, and eventually partnership, from all parents? The ‘‘cookie cutter model’ is inappropriate due to stresses (increased mobility, work hours outside the home, divorce rates, and developmental learning barriers) to the family unit” (Briar-Lawson et al. 1998, 2. 10). Parents have varied needs that require principals to identify diversely responsive ways of creating partnership opportunities to leverage resources that address those needs.

Where should resources be focused so that educational leaders may adapt improvement practice so that school-family-community partnerships are substantively established? What are the operating norms and values that principals need to promulgate so that a school culture thrives in sustaining parent involvement that leads to collaborative partnerships? Is it possible to have more than a select few parents – those who seem to have the most time and financial resources – partner with school staff on school improvement practice initiatives? The sections that follow continue to outline strategic interventions that address, or help educational leaders to consider how these questions may be answered.

**Build staff capacity for improved instructional practice.** Douglas Reeves in “Power Standards” (2002, 245) discussed a “zero announcements” policy for staff
meetings so that the faculty agenda could be utilized for professional development. This is an example of how educational leaders can reorganize the customary way of holding staff meetings. By doing this, the principal is able to address valid concerns staff have regarding the lack of time allotted within the school day.

With limited time to meet as a staff, it is hard to focus on developing skills to sustain a climate that is more conducive to creating and maintaining parent partnerships. However, staff meetings can be an opportunity for embedded professional development that supports distributed leadership practice: each staff person is empowered to support resource-oriented activities even if this means performing tasks outside of their primary roles. For example, faculty can be encouraged to offer instructional tools to cafeteria staff who engage students in conversations about their homework assignments. Cafeteria staff with an interest in asking students about their homework could then be trained by teachers to coach students through completing the homework assignments that are discussed.

Time during faculty meetings can also be devoted to staff developing and practicing parent engagement skills. During staff meetings, staff may need to be encouraged and trained to positively redirect “toxic” conversations or discussions – to adopt strengths-based language and strategies that are supported by researched best practices. Strengths-based strategies are marked by efforts to acknowledge what has been ineffective by focusing on what is working well.

Having structures in place to support staff in building their capacity to constructively engage parents will better position staff to constructively describe any barriers to, or challenges associated with, delivering instruction. Building this type of
staff capacity is essential when partnering with community stakeholders who may be able to provide additional supports to drive school improvement practice.

*Provide transparent learning supports.* As community stakeholders become more involved in school improvement practice, principals will need to lead their staff in ways that engender a school climate that deters “instructional buffering” – protecting teachers from evaluation (Elmore 2000).

This buffering prevents examination of classroom instruction. Instructional practice in isolation can greatly discourage collaborative efforts with parental and community stakeholders. Principals must create a school culture in which each staff member does not view instructional buffering as inevitable, but rather practice that will not be tolerated.

A distributed leadership versus a visionary leadership model may better support this type of school climate (Elmore 2000). When principals employ the distributed leadership model, every person on the school staff is empowered to respond to instructional needs. This includes the bus driver, hall monitors, cafeteria staff, maintenance personnel as well as faculty. Each member of a school’s staff focuses on how to more effectively support instruction. Principals who operate solely within a visionary leadership model are enthusiastic about the school’s vision but have not created a school climate and culture that would foster needed change.

*Build staff confidence.* If staff are well equipped to provide instruction within a supportive school culture, their confidence should build. As a result of this confidence, transparency of instruction should follow. Instructional staff will feel more comfortable
opening their classroom doors knowing that they have the support of the administrators who have entrusted them with delivering appropriate lessons.

As part of the distributed leadership paradigm, staff are equipped to be free to make decisions as long as they are serving the values and ideas of the school as a “covenantal community” (Sergiovanni 1992). The principal leads in a manner which conveys that transparency of instructional practice is a central component of this covenant or agreement among the staff. All staff must work to consistently evaluate and improve instructional practice so that the changing needs of the students, families, and community stakeholders served will be met.

Communicate respect for parents as school partners. Principals who seek to be effective instructional leaders must model and work to encourage the guiding principle that parents are expert partners. Parental partners seek to provide the best advocacy for their sons and daughters. Parents should not be viewed as a divisive constituency who do not warrant adequate access to “what goes on in the classroom” because they are ill-suited to make contributions to academic reform efforts.

Effective leadership for a comprehensive system of learning supports utilizes parental partners in a number of essential initiatives. These include curriculum planning projects. School leaders should also create opportunities for parents to assist with how to design school programs to better meet the co-occurring needs of students. Principals should make fostering collaborations between teachers and service providers a priority. Instructional decisions should be guided by the research on systemic ways to reduce fragmentation regarding how services are delivered.
**Expect successful partnerships with parents.** As part of effective leadership practice, the successful educational leader is able to leverage resources in ways that can serve parents better. With the school’s access to more resources, parents who may not currently be able to partner in ways that they would like because of competing interests would have more access to supports. These parents may experience stresses concerning economic, social, and emotional challenges.

Educators, service providers, and other professionals must view parents and families as “genuine partners” that trust and have mutual respect for one another (Anderson-Butcher et al. 2004, 7.6, 7.8). School-family and service provider partnerships are also marked by the following:

- Communication that occurs regularly, not just when crises arise;
- Families that are supported through linkages to emergency assistance and other needed resources;
- Social capital and a sense of community built by helping isolated parents become connected;
- Family-to-family networking that is encouraged and supported;
- Younger parents who are targeted for support that meet their needs; and
- Training that is provided for staff and parent volunteers to create and maintain partnerships with “hard-to-reach priority families” that often do not attend school functions or teacher meetings (Anderson-Butcher et al. 2004, 7.8, 7.13, 7.14).

This caliber of principal leader realizes and consistently conveys to his staff the focal role they must play. School staff play a substantive role in setting academic expectations of students. It is up to the school staff to identify opportunities to reinforce
these expectations. In doing so, school leaders must create and sustain effective parental partnerships that will encourage student achievement.

Henderson et al. (2007) in Beyond the Bake Sale emphasized effective family-school partnership practices. The authors referred to the work of Joyce Epstein at Johns Hopkins University to establish school environments that sustain parent partnerships. Epstein and co-author Steve Sheldon (2006) in “Moving Forward” discussed the importance of realizing that the industrial school described in Weber’s (1947) work is no longer an effective model. Weber’s model consisted of separate roles, responsibilities and goals for school and parents.

Contemporary parent partnership models, like the ones espoused by Epstein and Sheldon, are guided by the theory of overlapping spheres of influence. This theory focuses on “three contexts – home, school and community – [that] overlap with unique and combined influences on children through the interactions of parents, educators, community partners and students across contexts” (Epstein and Sheldon 2006, 118).

A comprehensive system of learning supports must take all three contexts into consideration. What happens at home and in the community affects the type of learning that can take place in school. In kind, what occurs during the school day can impact what happens at home and in the community. Stakeholders across these three contexts must understand the impact each environment has on students in order to glean opportunities to identify enhanced, comprehensive learning supports.
Communication of the Vision to Promote Comprehensive Supports

Leadership rests on the substance of values and ideas (Sergiovanni 1992). Successful educational leaders consistently communicate their core values and ideas through their interaction with the staff, students, families, and community served.

It is often challenging to explicitly convey the operational and structural procedures for sustaining school access to comprehensive learning supports (Lawson 2007). This sustained effort requires designating “responsibilities and accountabilities” and establishing a “deliberate configuration to achieve specific outcomes” (Lawson 2007, 7). It is essential that those responsible for these activities are perceptive to questions, concerns and/or issues they may have during the process.

Discernment. Reeves (1992) in “Power Standards” described effective leadership as having a particular skill set that includes discernment. Effective leaders are able to discern how changes in the school environment may impede school improvement practice. Reeves referred to utilizing such skills when conveying nuances in standards that may reflect the current curriculum. This concept can also be applied to staff receptivity to learning supports reform.

Moreover, effective principals communicate that creating and utilizing a comprehensive learning supports system for school improvement is the “right thing to do.” It is right even if such practice is contrary to what was done in the past. Successful school leaders also continually wonder whether current practice is yielding the expected results for their schools.

Maximization of partnership opportunities. As an integral part of the learning supports paradigm, educational leaders seek to implement initiatives that maximize
opportunities for resource allocation. School leaders generate resources, supports, and services that the school accesses through working in partnership with stakeholders outside of the school’s walls. These assets would not be available if schools and districts operated alone (Lawson 2007).

Working with community or service provider stakeholders who have the authority and capacity to partner is also key. An educational leader or designee with strong facilitation skills will be needed to ensure that public engagement activities revolve around “civil exchange of ideas among participants without grandstanding or polemics” (Henderson et al. 2007, 4).

**Peer training.** Expecting educational staff and service providers to operate differently depends on the ability to create opportunities for them to learn how to function well in newly designed roles. A distributed leadership model supports such reform. When this model is utilized, the capacity of those in positions of authority is developed so that others may be trained by them. This training should lead to enhanced staff performance that fosters comprehensive learning supports. The status of new and previously developed relationships will also need to be monitored to ensure that sound structures are in place to provide the types of learning supports that will lead to school improvement practice.

**Mature and secure staff.** Principals seeking to build and enhance a comprehensive system of learning supports also realize that staff development is an essential component of service delivery. The majority of the staff needs to include “secure and mature professionals [so that] reshaping of professional identities [will lead
to] professionals currently engaged in direct service to children and families [rethinking] the way they work separately and together” (Mooney et al. 1999, 109, 105).

Educational leaders must spend the necessary time to create a professional learning environment that is conducive to partnership building. This environment encourages staff (both educators and service providers) to inculcate values and ideas that foster transparency as well as a willingness to humbly implement reforms.

Successful students. As a result of creating a sustained professional learning environment, there will be increased opportunities for student achievement—academic, social and emotional. Having staff who exemplify the capacity to uphold the norms and values of strengths-based practice is essential. Community stakeholders will be more likely to work with school staff whose practices exemplify strengths-based norms and values. This work can lead to substantive reform. Devising ways for educators, service providers, parents, and administrators to participate in training together is an ideal way to support such reform.

Change as an expected occurrence. Lastly, effective principals assess the strength of the structures that are in place in the public school to enhance access to a comprehensive system of learning supports. This should occur on a regular basis, particularly as the demographics change in the student population and as staff change positions.

The needs of students, their parents, and the staff seeking to serve them may consistently change. Each change is likely to be coupled with a different set of needs, assets and opportunities associated with creating viable family-school-community connections. Effective principals need to expect such change and work diligently to build
supports so that opportunities for student learning, guided by school improvement practice planning, will not be negatively impacted.

**Strengths-based philosophy.** Encouraging staff to acknowledge problem areas and barriers to providing learning supports while focusing their energies on envisioning the possibilities for reform is important. The principal who espouses a strengths-based philosophy of leading seeks to consistently provide such encouragement. Over time, as part of a distributed leadership model, staff will assimilate these strengths-based norms and values. The more staff operate based on a strengths-based philosophy the closer the school community will be to realizing systemic change.

School improvement practitioners who seek opportunities to partner with parents and community stakeholders can create a new “status quo” – one that is characterized by strategically responsive and persistent connections for comprehensive learning supports. These connections can be sustained between the public school system, parents, and the community to the benefit of current and future generations.
Works Cited in Appendix G

Adelman, H. and L. Taylor. 2007. *A resource aid packet on addressing barriers to learning: A set of surveys to map what a school has and what it needs.* Los Angeles, CA: Center for Mental Health in Schools at UCLA.


Sample Logic Model: Conditions, Inputs and Underlying Assumptions of Youth Programming (Perkins, 2009)

**Conditions** – problems identified through an inventory, e.g., the Adelman and Taylor (2007) survey or an assessment that considers both strengths and weaknesses

**Assumptions** – how intended youth development program will yield intended outcomes

**Inputs** – Examples: professional development, fiscal or time management
Based on feedback from the administration of the Office of K-16 Initiatives, the Teacher Development Programs Unit no longer exists. This change took place in December 2011.
APPENDIX J

American Association for Budgeting and Program Analysis

By Student Reporter, Susan C. Perkins

The lunch plenary on May 11, 2011, featured speakers Thomas Skelly, Director of the Budget Service and Acting Chief Financial Officer in the U.S. Department of Education and Elizabeth Robinson, Chief Financial Officer in the National Aeronautics and Space Administration (NASA). Ms. Robinson and Mr. Skelly gave informative and engaging presentations.

The audience was comprised of budget and program analysts, CFOs, other financial executives, COOs, policy analysts, other government personnel, and students of fiscal management. Ricardo Aguilera, Associate Professor of the CFO Academy, moderated the session. As part of Professor Aguilera’s introduction of the speakers, he described the urgent need for organizations to collaborate in new ways so that data not only provides information, but innovation.

Three key leadership strategies for today’s accounting and financial leadership emerged across the presentations: (1) tactical planning that promotes collaboration, (2) staff management styles that foster trust and (3) communication initiatives that clarify directions and ensure transparency.

Tactical planning that promotes collaboration. Ms. Robinson began her presentation by describing the changing fiscal environment. Organizational leaders are now charged to use data and provide value-added analysis despite staff shortages and other resource constraints. Given these dynamics and the competing demands of overlapping projects, Ms. Robinson recommended that organizations have more than one strategic plan. Like Ms. Robinson, Mr. Skelly stressed the importance of being able to consider all factors when planning. He remarked that CFOs in particular develop skill sets that enable them to “step back and look at the big picture.” (These skills are acquired by CFOs as they regularly prepare to meet auditing demands.) Having more than one plan, Ms. Robinson explained, allows the fiscal leadership team to track critical resources and avoid lack of planning for unrealized obligations. Ultimately, this type of long range planning promotes financial stability founded on what she described as “data people trust [and] conclusions people trust.”

38 MPA/MPP students were invited to apply to fill Student Reporter positions for the AAPBA conference held at the Capitol Hilton Hotel in Washington, DC. As part of the review process, applicants were asked to submit a writing sample. The title of my submittal was, “The 2011-2012 Executive Budget and Funding for Career and Technical Programming,” prepared for Professor Ruth S. Walters, PAD 677: Public Policy Process, Rockefeller College, University at Albany.
Staff management styles that foster trust. Both speakers highlighted the importance of creating a supportive work environment. Staff should be encouraged to consistently develop their skills, even while fiscal leaders face a season of what Ms. Robinson described as “managing in uncertainty.” As staff face fiscal pressures they haven’t experienced before, “calming people down” has become a common leadership role.

Mr. Skelly encouraged the audience to allow their staff to “learn by doing . . . making mistakes [which is] scary for the supervisor and the person, but in the long term, this is the best way to develop.” Both speakers commented on the challenges of developing talented staff only to see them transition to other workplaces. Despite the possibility of this occurring, fiscal leaders with integrity afford their staff every opportunity to develop their skill sets.

Communication initiatives that clarify directions and ensure transparency. Fiscal management teams that successfully collaborate across departments and organizations receive clear direction. For example, Ms. Robinson remarked that fiscal leaders need to be aware of how terms are used across working environments: “‘Obligations’ means something different to an auditor versus a budgeteer.” Mr. Skelly underscored the benefits of using graphics and other visuals in budgets to clarify communication. He cautioned that often, “Budgets use too much text” and exhorted the audience to include more visually appealing data in fiscal reports.

The information presented by Ms. Robinson and Mr. Skelly reflects the critical findings of more than 150 career development professionals from across the United States, Canada and the United Kingdom.39 These career experts concluded that tomorrow’s business leaders and top candidates have a collaborative working style, an innovative thought process and superb communications. One of tomorrow’s business leaders, AABPA Student Reporter, Iris Afonso, from the University of Georgia’s Master of Public Administration Program shared her thoughts: “They offered lighthearted perspective to the daily challenges, but also advice and affirmation to workers in the public financial field about the significance and potential of their contributions.” It was an honor to report the insights of such distinguished financial leaders as Ms. Robinson and Mr. Skelly.