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4-H Summer of STEM: A Practical Approach to Increasing Workforce Readiness

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Abstract. 4-H Summer of STEM is a workforce readiness program for high school youth. The goals of the program are to increase students' interest in STEM careers, improve college and workforce readiness, and connect youth to businesses and industries in the local community. Selected youth receive hands-on development of workforce readiness skills, are paired with a STEM mentor for job shadowing, and participate in college campus visits. Preliminary findings show that participants reported having a positive relationship between participation in 4-H youth development programs and career skills. This article introduces the 4-H Summer of STEM and offers suggestions for implementation.

INTRODUCTION

Youth of the twentieth century are expected to enter the workforce with the knowledge, skills, and abilities needed for the career cluster of their choosing. For some youth, this may include skills in science, technology, engineering, and math (STEM). 4-H is the youth development organization of the Cooperative Extension System. This national organization serves youth in the areas of healthy living, civic engagement, and STEM. In Maryland, 4-H has identified college and career readiness as a priority need area and encourages youth to pursue high-quality STEM educational experiences.

The Summer of STEM is a program designed to increase college and career readiness of high school-aged youth. Studies showed that youth were more likely to find career fields that matched their interest after participating in long-term youth development programs (Price et al. 2011). The Summer of STEM connected motivated students to industries in the local community, increasing the social capital of participants. According to North Central Extension and Research Activity (NCREA215), social capital is the connection between individuals and their social networks. Through social capital, young people gained access to opportunities, experiences, and support that influenced their educational and career goals (NCREA 2016).

METHODOLOGY

The design of the Summer of STEM program used the Experiential Learning Model reported by Kolb (1984) to allow youth to experience careers. The Kolb model states that youth learn using hands-on experiences followed by intentional reflection and application of learned skills to other situations (1984). To solicit participants, website advertisements, teacher emails, and social media posts were sent into the community. Applications were live for three months. Researchers implemented a selection process to find participants, including an application, teacher recommendations, and a professional interview.

The program depended on a strong network of community partners who work in STEM careers. According to Mitchell-Hawkins (2019), networks are an important part of a community that lead to better opportunities for positive youth development. Site mentors were screened using university safety protocols and are paired with selected youth. Site mentors varied in specialty based on youth interests and included agricultural photographers, biotechnology laboratories, data scientists, electricians, engineering firms, farriers, horse breeders, IT professionals, and veterinarians. Participants engaged in high-quality experiences that simulated the expectation(s) of the

site mentor's career STEM role. For example, youth that were paired with environmental engineers ran tests on water samples and performed data analysis. In addition to the worksite experiences, youth learned about college and career readiness. Workforce development training included topics such as career inventory assessments, workplace culture, personal branding, managing workplace conflict, career research, resume building, personality assessments, workplace etiquette, and leadership styles. Summer of STEM also connected participating youth to local two- and four-year college campuses. This approach to preparing pre-college-aged youth is effective in supporting the transition to higher education. College admissions counselors advised the youth on admission processes, program offerings, with campus facility tours. Following the Experiential Learning Model, intentional reflection and exploration was built into the program on a weekly basis through journaling or digital storytelling. These activities allowed youth to generalize and apply lessons learned.

To assess the Summer of STEM experience, including knowledge, skills, and attitudes of participants related to college and career readiness, youth and site mentors were given electronic surveys. Program evaluation was conducted using 4-H Common Measures 2.0 College and Career Readiness. Data was collected over a four-year period with 25 youth participants in total (n=25).

CONCLUSIONS

Twenty-five youth participated in the program and reported positive outcomes in the areas related to workforce readiness. Data suggested that youth who conducted career inventory assessments and engaged in job shadowing opportunities had an increased awareness for future planning (Price et al., 2011). Of the 25 respondents surveyed, 75% reported having a resume, and 84% learned how to prepare for an interview. All 25 participants believe it is important to arrive at work on time and to be trusted by an employer, while 96% learned how to act professionally during the Summer of STEM program.

Youth who participated also reported a positive relationship between participation in 4-H youth development programs and career planning skills. This finding supports the work of Ratkos (2015), who stated that youth involved in 4-H were better prepared for the challenges associated with college. Of the 25 participants surveyed, 96% stated that they have an idea of what they would like to major in at a college. In addition, 88% reported that 4-H had helped them in their decisions about college. Youth were able to relate the life skills learned in 4-H Summer of STEM to those needed in their projected career path. All 25 respondents also reported that 4-H had helped them identify personal strengths. 92% of the youth stated that 4-H had helped them explore future career options and that they were able to identify careers that might be a good fit for them. Additionally, 88% of youth reported that they had a better idea of what they might do after high school because of 4-H.

In qualitative data sets, youth reported positive experiences after participating in the program. When asked "What has been the most important thing you have learned by being involved in the 4-H Summer of STEM?" youth stated the following:

- "I gained information and experience you can't get in school."
- "How to hold a job and professionalism"
- "I've learned about my love for engineering and passion for robotics."
- "How much education is important for college"

When asked "How might you be different if you had never been involved in the 4-H Summer of STEM?"

- "I might not have gained leadership abilities and skills in working with children."
- "I wouldn't be as good with public speaking."
- "I would not know what I want for my future career."
- "I would have still been struggling with social anxiety and be less social with new people."
- "I wouldn't have as many friends as I do and wouldn't miss out on a lot of connections that will benefit me greatly later on in life."

IMPLICATIONS

The 4-H Summer of STEM program began in a metropolitan suburb in central Maryland with a clear delineation of rural, suburban, and urban communities. In year two, another county in the state replicated the program with a largely rural population,suggesting that the program can be adapted for all communities. Assessment tools for site mentors are in the pilot phase, but preliminary data suggests that respondents noted increases in confidence and maturity after participation in the program. For example, site mentors found that youth in Summer of STEM developed skills necessary to prepare them for their future. Future project plans include increasing the scope to include other states. Stipends for youth in another aspect of the program that has been introduced but more data is needed to make conclusions about the viability of scaling this aspect of the program in other communities.

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