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Perceived Barriers to Higher Education in STEM Among Disadvantaged Rural Students: A Case Study

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As part of a grant funded by the National Science Foundation (NSF), Southwest Virginia Community College conducted a case study to explore Science, Technology, Engineering, and Mathematics (STEM) scholars' perceptions of Southwest Virginia Community College's (SWCC's) S-STEM scholarship program. The primary goal of the SWCC S-STEM program is to increase the number of talented but financially disadvantaged residents of Southwest Virginia who achieve higher education degrees in science, technology, engineering and mathematics. The program typically serves between 26 to 28 talented, financially-disadvantaged students, with emphasis on low income students, rural residents, women, minorities, and students with disabilities.

The problem that the S-STEM students most often identified as a barrier to their pursuit of educational goals and careers aspirations in the STEM fields was inadequate high school preparation. It was, therefore, not surprising that students reported that few advanced math or science classes had been offered at their high schools. The second barrier often cited was work conflicts.

Table 1 below provides outcomes for the SWCC S-STEM program over the last seven years in terms of student retention, returning students, graduation rate, and percentage of students who transfer to a senior institution upon completion of the program.

TABLE 1: RESULTS FROM CURRENT NSF S-STEM PROGRAM 2007-2014

		Retention	Graduation			
Year	**Cohort**	**Fall to Spring Retention**	**Fall to Fall Retention**	**Fall to Fall Returning/ Graduates**	**Within 3 Years**	**% of Grads in Original Major**
2007-08	N/A	N/A	N/A	N/A	N/A	N/A
2008-09	27	27 [100%]	26 [96%]	18 Returned/ 8 Graduated	24 [89%]	18 [75%]
2009-10	28	27 [96%]	25 [89%]	13 Returned/12 Graduated	22 [79%]	15 [68%]
2010-11	26	26 [100%]	24 [92%]	21 Returned/ 3 Graduated	19 [73%]	16 [84%]

2011-12	31	25 [81%]	24 [77%]	9 Returned/ 15 Graduated	21 [68%]	18 [86%]
2012-13	27	24 [89%]	22 [81%]	15 Returned/ 5 Graduated	19 [70%]	16 [84%]
2013-14	28	28 [100%]	27 [96%]	17 Returned/ 10 Graduated	22 [79%]	17 [77%]

Note: 2013-14 had only two years of graduation data; 2014-15 Not Yet Available

SWCC is located in the heart of the Appalachian coalfields. The college's service region faces significant educational, geographic, and economic barriers to the creation of a technologically-competent workforce. The Appalachian region "sees little inward migration as a whole and corporations located in the region consistently struggle to hire qualified local workforce" (Carrico, Boynton, Matusovich, & Paretti, 2013, p. 2). Appalachian youth do not pursue higher education at the same rate as youth in other regions (Carrico, 2013), and rural Appalachian students have "a unique combination of small schools, higher than average rates of poverty, lower than average educational attainment, a high percentage of blue-collar employment, and less ethnic diversity than non-Appalachian regions" (Carrico, et.al., 2013, p. 2). Additionally, most SWCC students are typically first-generation college students. In this context, students of the region encounter substantial barriers, both real and perceived, to completing a college degree.

Because SWCC's S-STEM program works to recruit and retain these students to degree achievement, the program has a strong focus on mitigating barriers to completing a college degree. Given the substantial barriers to educational access and opportunity facing the underrepresented and disadvantaged students of Southwest Virginia, this study addresses the following research questions:

1. What are students' perceptions of barriers to STEM higher education?
2. Do students perceive that the Southwest Virginia Community College's S-STEM program removed any barriers to their educational goals and STEM career aspirations?

Federal government projections indicate that, in the future, the fastest-growing and the highest-paying careers will be in STEM (Bureau of Labor Statistics, 2009; Langdon, McKittrick, Beede, Khan, & Doms, 2011). Given the changing demographics of the United States (Passel, Livingston, & Cohn, 2012) and the increasing demand for skilled STEM workers to sustain the country's economic growth and competitiveness (Holdren, Lander, & Varmus, 2010; Stine & Matthews, 2009), increasing the number of students in STEM fields is vital. However, in the K-12 STEM education context, structural barriers prevent low-income students from accessing STEM resources and facilities, high-quality STEM teachers, courses in technology and computer science, advanced coursework in general, and equitable school funding overall (College Board, 2012; Barondess, Hahnel, & Schroeder, 2012; Dorph, Shields, Tiffany-Morales, Hartry, & McCaffrey, 2011; Goode, 2010; Handwerk, Tognatta, &

Coley, 2008; Margolis, 2008). These educational and socio-economic barriers limit these students' opportunities for success as well as their competitiveness in STEM.

Furthermore, several research findings indicate that the poverty encountered by many rural youth substantially increases their risk for educational problems (Crosnoe, Mistry, & Elder, 2002; Farmer, T.W., Dadisman, K., Latendresse, S., Thompson, J., Irvin M., Zhang, L., 2006; Johnson & Strange, 2007; Roscigno & Crowley, 2001). Impoverished rural students also have the highest dropout rates in the country, and these rates are more than twice the national average (Provasnik et al., 2007). Another problem in rural areas is that geographic isolation can combine with social and cultural norms to constrain students' educational aspirations (Farmer, et al., 2006; Hardre & Sullivan, 2008).

The lack of institutional supports in rural schools has proven to be a significant hindrance to students achieving educational aspirations (Farmer, et al, 2006, Hardre & Sullivan, 2008; Roscigno & Crowley, 2001). Many rural schools have difficulties providing institutional support resources such as school activities due to factors such as financial limitations, extended travel distances, a lack of public transportation, or other constraints (Farmer, et al., 2006; Hardre, Crowson, Debacker, & White, 2007; Mahoney et al., 2005). In addition, national reports indicate that rural youth have less access to advanced high school courses (Planty, Provasnik, & Daniel, 2007), and schools have trouble attracting and retaining teachers to instruct advanced courses (Monk, 2007). Financial limitations and limited resources contribute to this problem, but geographic isolation is also a problem. Rural students are less likely to have access to guidance counselors and to participate in postsecondary preparation activities, such as college campus visits and career exploration (Griffin, Hutchins, & Meece, 2011).

Lent, Brown, and Hackett (2000) have suggested that "people are less likely to translate their career interests into goals, and their goals into actions, when they perceive their efforts to be impeded by adverse environmental factors (e.g., insurmountable barriers or inadequate support systems). Conversely, the perception of beneficial environmental factors (e.g., ample support, few barriers) is predicted to facilitate the process of translating one's interests into goals and goals into actions" (p. 38). Barriers may be defined as "events or conditions, either within the person or in his or her environment, that make career progress difficult" (Swanson & Woitke, 1997). According to Social Cognitive Career Theory, perceived barriers can have a direct impact on students' interest in and pursuit of careers (Fouad & Byars-Winston, 2005; McWhirter, 1997; Brown & Lent, 1996).

To increase the number of underrepresented Appalachian students who enter and complete STEM higher education programs, we need to examine these students' perceptions of barriers to STEM education, as well as resources available to support the students in overcoming such barriers.

The goal of this case study is to determine the perceptions of S-STEM scholars regarding whether the SWCC S-STEM Program can mitigate the barriers they have identified to their pursuit of a STEM degree. In addition, this study seeks to contribute to understanding of underrepresentation of disadvantaged students in STEM fields by examining perceptions of barriers to pursuing STEM in higher education.

METHODS

To determine the effect Southwest Virginia Community College's S-STEM scholarship program has had on participants' abilities to overcome any perceived or actual barriers, the SWCC S-STEM principal investigator implemented a focus group followed by a survey instrument. Both were conducted on the SWCC campus in Richlands, VA. Volunteers were solicited to participate in the focus group and six students volunteered to participate in a group interview. The results of the interview governed the development of a survey which was disseminated to 27 current scholarship recipients.

RESULTS

Focus Group Results

The principal investigator of SWCC's National Science Foundation S-STEM Program conducted a focus group meeting prior to designing the final survey instrument. Scholars in the S-STEM program were contacted and asked to volunteer for participation in a focus group meeting four weeks before the survey was conducted. Seven students (four male and three female) responded that they wished to be included in the focus group. However, one female volunteer was unable to attend, so a total of six students participated. Five of the students were Caucasian, and one was Asian; all six students were second year S-STEM scholars, and all but one were traditional students. The focus group meeting was held on-campus.

The following questions were posed to the students:

- Where did you grow up?
- Where did you go to high school?
- Why did you choose your major?
- Do you know anyone with a career in your major that influenced you?
- How did you hear about the NSF scholarship program?
- Why were you interested in a NSF scholarship?
- What barriers have you overcome?
- Do you feel the barriers you are identifying now are the same as you would have listed while in high school?
- Are you concerned with staying in the area for future education or future jobs?

- What barriers do you feel you still have to overcome or cannot overcome?
- Are these barriers unique to disadvantaged rural students? Are barriers unique to STEM majors?
- What are your first impressions of the STEM program? Advantages to being in program?
- Are there any expectations for STEM program that have not been met?
- What are your plans in the next two to three years? Plan B?
- How confident are you in getting a job upon completion of program?

The most significant findings from the focus group highlighted the barriers that students experienced in pursuing an education in a STEM field and the elements that they perceived as possible barriers. Student responses were very similar to the issues that several previous studies and research have cited as real barriers that Appalachian youth typically encounter in their pursuit of a career in STEM fields. Barriers that students noted they had faced in their efforts to pursue a major in a STEM field included the following concerns:

- Everyone in the family (except one or two) was discouraging about going into STEM
- No family members had previously attended college
- A homeschooled student felt socially awkward and found it difficult to get used to the college environment
- A student who had attended multiple high schools in a neighboring state and started engineering classes in sophomore year was discouraged to find upon moving to this region that no engineering classes were offered at the new high school
- No family members were working in a STEM field
- Insufficient number of specialized classes were offered at high school
- High schools in region did not encourage choosing a career early in the academic program
- No motivation to pursue STEM careers in high school
- Having to build from bottom up and having to take all of the algebras at the college level
- High schools do not offer classes needed for STEM fields and necessary in college, such as calculus

Perceptions students had about barriers to pursuing a degree in STEM fields were also articulated in the comments below:

- The region is not "big" on science
- STEM fields are frowned upon

- STEM students regarded as "just nerds"
- High schools tend to encourage students to just go to trade school and "get a trade"
- Rural areas are at a huge disadvantage for industrial or scientific careers because they do not have the infrastructure for technology that STEM jobs rely on
- No STEM jobs in region so you will have to move away
- Confident program will lead to a job in STEM but you have to be willing to move

The questions used for the Focused Group meeting are included in Appendix A. Based on the results of the focus group, 18 questions were included in the final survey instrument to examine student perceptions about real and perceived barriers to the pursuit of a STEM degree and to gauge students' opinions regarding the effectiveness of the S-STEM program at SWCC. For example, questions addressed barriers regarding inadequate high school academic preparation, barriers concerning insufficient time for study/class preparation because of job obligations, and perceived barriers concerning potential future STEM careers. Questions addressing perceptions of the effectiveness of the S-STEM program at SWCC asked students to choose the aspects they felt were the most helpful part of the program.

The method used for the survey instrument was multiple choice questions and one open-ended question. Twenty-one students, including nine science majors, nine engineering majors and three electrical/electronics technology majors completed the survey. (The questions used in the survey instrument are included in Appendix B).

Survey Results

Survey results indicated that inadequate high school preparation was a significant barrier experienced by S-STEM scholarship recipients. High school course availability and enrollment have been shown to predict academic achievement and college enrollment (Lee, et al, 1998; Adelman, 2006). Smaller schools may be unable to provide advanced placement or college preparatory courses (Greenberg & Teixiera, 1995). In the rural, low-income schools found in Southwest Virginia, this reality is evident. Survey responses (see Appendix C: Question 1) indicate that most of the rural high schools that S-STEM students attended did not offer higher level math classes beyond pre-calculus, although slightly over half offered calculus. Furthermore, most students did not have access to advanced science classes or engineering classes at their high schools. Another frequently cited barrier was a conflict with work hours and its impact on time for class preparation and review (see all reported barriers in Appendix C: Question 2). Twenty-five out of the total 27 scholarship recipients were employed while maintaining a full-time class load. Of those employed, 14 students worked more than 20 hours/week.

While indicated less frequently, students specified a lack of confidence in obtaining local employment in a STEM career after graduation (see Appendix C: Question 3). In rural Appalachian communities, mobility, whether geographic or social, may conflict with existing strong ties to family and friends (Haight & Gonzalez-Espada, 2009), so this barrier can be significant.

As anticipated, many scholarship recipients indicated a desire to stay in Southwest Virginia after graduating. Consequently, most viewed the need to relocate for career opportunities as a barrier to pursuing a STEM career. However, confidence was considerably higher in students' perceptions regarding the ability to obtain employment if relocation were a possibility. Specifically, 76% of students indicated that they felt confident they would find employment in a STEM career if they relocated from Southwest Virginia (see Appendix C: Question 4).

Students were also surveyed regarding any barriers they anticipated encountering in the future as they pursue a career in a STEM field (results are provided in Appendix C: Question 5). Over half indicated the need to relocate to find a job (57%) and high stress (52%). Twenty-four percent (24%) anticipated that few job opportunities could be a barrier and 24% indicated that confidence in their ability to succeed could be a barrier.

When questioned concerning the effectiveness and support provided by the NSF S-STEM scholarship program, 20 students who participated in the survey indicated that tuition/book funding was most helpful. Eighteen students indicated that opportunities to visit transfer schools were helpful. Fifteen students also selected the opportunity to meet other students with similar interests was helpful; 14 liked the opportunity to hear guest speakers in STEM fields; and11 students indicated mentoring from faculty was also paramount to the effectiveness of the S-STEM program. (See Appendix C: Question 6 for additional information.)

The survey also asked students how they heard about the S-STEM program. The method that the largest group of students identified was in conversations with SWCC faculty (38%). Only 24% had heard about the program from their high school counselor and only 24% of the students indicated they had learned about the program through the SWCC website (see Appendix C: Question 7).

ANALYSIS

The problem that the S-STEM students most often identified as a barrier to their pursuit of educational goals and careers aspirations in the STEM fields was inadequate high school preparation. It was, therefore, not surprising that students reported that few advanced math or science classes had been offered at their high schools. The second barrier often cited was work conflicts. This finding was also not surprising since 25 of the 27 scholarship recipients were employed while carrying a full class load and over half worked more than 20 hours/week. These results are very similar to the same issues discussed in the research studies referenced earlier in this report.

DISCUSSION

The results of the focus group and survey indicate that, as expected because of the demographic realities detailed above, students in the SWCC S-STEM program experience a wide variety of barriers to STEM educational and career success, including economic, geographic, social, and educational barriers. The barriers cited included lack of family support; lack of mentoring and career guidance; lack of other institutional supports such as access to advanced high school courses and funds to participate in postsecondary preparation activities; and a lack of confidence in obtaining employment locally.

SWCC's S-STEM program worked to address the identified barriers by providing much-needed financial and student support. Twenty of the 21 students who participated in the survey indicated that tuition/book funding was the most notable and helpful aspect of the program. The second aspect of the program that students indicated as most helpful were the visits to transfer institutions. Students also indicated the opportunity to hear guest speakers in STEM fields, opportunities to meet other students with similar interests, and receive mentoring from faculty were also paramount to the effectiveness of the S-STEM program.

One of the results that may warrant further investigation included the responses around how students learned about the SWCC S-STEM program. Many of the students indicated they were not aware of the program until they enrolled at the college; this finding indicates a potential need to identify additional opportunities to disseminate information about the program to high school students.

This study can also be further strengthened by investigating other factors that might hinder low-income students from achieving their educational aspirations in STEM fields, such as important differences within gender and within racial and ethnic groups. For instance, do females feel they will encounter discrimination based on gender? Is there a difference in females' perceptions of their abilities, talent or confidence to be successful in a STEM field or to fit in at the workplace? Is there a difference within racial and ethnic groups in the program?

CONCLUSION

This study found that students in the NSF S-STEM program at Southwest Virginia Community College experience a number of significant barriers to pursuing STEM degrees. In helping underrepresented students overcome barriers to STEM achievement, the SWCC S-STEM program contributed to the production of qualified STEM graduates in the workforce, thereby supporting economic growth at the local, regional, and national levels. Further research may be needed to understand the long-term implications of Southwest Virginia Community College's S-STEM program regarding perceived barriers, students' entry into and sustainability in careers in STEM fields, and the overall impact of the program on students' futures.

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APPENDIX A

Focus Group Meeting

Can we talk a little bit about you …

1. Where did you grow up?
2. Where did you go to high school?
3. What is your major at SWCC?

Let's talk a little about how you came to pick this path…

4. Why did you choose your major?

   Probes:

   - Were there some things about high school that influenced your choice of this major?
   - Did you know anyone else in your major?
   - What is good/bad about your major?
   - How does your major relate to this area?
   - How did people react to your decision to go to college and major in a STEM field?

5. Where did you hear about the NSF S-TEM scholarship program?

   Probes:

   - High school counselor?
   - Website?
   - High school teacher or college instructor?
   - Friends/peers?

6. Why did you want a scholarship/what motivated you to apply for a scholarship? What did you think the scholarship program would do for you now and in your future career plans?

   Probes:

   - High paying job
   - Prestigious job
   - Be in a "Helping" career
   - Pay tuition
   - Pay for books

Now, think about things you have overcome or thought you'd overcome… Let's talk about those.

7. What are any barriers you have/had to attending college and/or completing a college degree?

   Probes:

   • Expensive

   • Work/time to study and attend classes

   • Family obligations

   • Transportation

   • Education not valued in their families

   • Poor high school preparation

8. Do you think the barriers you identify now are any different than the ones you would have identified in high school? Do you think these barriers are unique to you? Why or why not?

   Probes:

   • Why do you perceive different barriers now?

   • Do you think the barriers you mention are real/perceived?

9. What are any barriers you have overcome?

10. What are any barriers you feel you still have to overcome?

11. Are there barriers you feel you cannot overcome? Why?

12. Do you think these barriers are unique to students in STEM majors? Are they unique to rural "disadvantaged" students? Why?

So we have talked about barriers…I want to follow up on that and talk a little bit about what you think about the S-STEM program at SWCC.

13. What was your first impression of the S-STEM program?

14. What do you think are any advantages to being a part of the S-STEM scholarship program? What are some aids we offered you that helped?

   Probes:

   • Field trips

   • Mentors

   • Advising

   • Tuition/books

   • Meetings/speakers

   • Tutoring

15. What expectations did you have that the S-STEM program doesn't do/hasn't done for you? What is the program not doing that you thought it would do?

    - Did you lower your expectations throughout the program or raise them?
    - Did you expect the program to offer you more than tuition and books? What?

We have talked a lot about the past and present…I would like to talk about the future…

16. Now that you've had STEM courses, are majoring in a STEM field, and have received a STEM scholarship, what are your plans for the next 2-3 years?

    Probes:

    - Ask them where they plan to transfer? Major?
    - Do they have a Plan B?

17. What type of job are you considering?

    Probes:

    - Ask them to describe their future job…What about that job is appealing to you?
    - Does the location of the job matter to you? Why?
    - How confident are you in getting that type of job? Why?

Considering all of these things we have talked about today…
You've provided me with some great information.

I've come to the end of my question list. I want to give you time to talk. I have told you a little bit about the current study. You have answered a bunch of questions. Is there anything else you want me to know?

APPENDIX B

NSF S-STEM scholarship recipient survey

Please complete the following survey. Place a check by your responses. Do not put your name on this survey. Your responses will be anonymous.

1. Where did you grow up?

   ☐ Southwest Virginia ☐ other region in Virginia

   ☐ West Virginia ☐ Tennessee ☐ Other

2. What is your major?

   ☐ Science ☐ Science (pre-pharmacy) ☐ Science (pre-medical)

   ☐ Electrical/Electronics ☐ Engineering

3. Do you feel like your high school education adequately prepared you for your STEM major?

   ☐ Yes ☐ No

4. Did your high school offer any specialized classes in STEM fields that helped prepare you for your major? Please check all that apply.

   ☐ Pre-Calculus ☐ Calculus ☐ Engineering

   ☐ Anatomy ☐ Advanced Chemistry ☐ Computer Science

   ☐ Statistics ☐ Advanced Biology ☐ Physics

5. Why did you choose SWCC to begin your education in a STEM field? (Please check all that apply.)

   ☐ reasonable tuition (financial reasons) ☐ close to home

   ☐ my friends were attending SWCC ☐ family/friend recommendation

   ☐ college has good academic reputation

   ☐ other-please specify:_____

6. Is there anyone that influenced you or encouraged you to pursue a career in your STEM major? Check all that apply.

   ☐ family member ☐ SWCC instructor

   ☐ friend ☐ no

   ☐ high school teacher ☐ other-please specify:_____

7. How did you find out about the NSF S-STEM scholarship program at SWCC?

   ☐ SWCC website ☐ SWCC faculty

   ☐ High school counselor

   ☐ other-please specify:_____

8. How difficult did you think it was to complete your NSF S-STEM scholarship application?

   ☐ very difficult ☐ somewhat difficult

   ☐ not difficult

9. What do you think is/are the best part(s) about the NSF STEM scholarship program? Check all that apply.

   ☐ tuition/book funding

   ☐ guest speakers in STEM fields

   ☐ meeting other students with similar interests

   ☐ opportunities to visit transfer schools

   ☐ mentoring from science, engineering and math faculty

   ☐ other-please specify:_____

10. Please list any suggestions for making the NSF S-STEM program better?

    _____

    _____

11. What are your plans for the next 2-4 years?

    ☐ bachelor's degree engineering ☐ pharmacy school

    ☐ medical school ☐ optometry school

    ☐ physical therapy school ☐ dental school

    ☐ bachelor's degree in science ☐ bachelor's degree in nutrition

    ☐ bachelor's degree in electrical electronics ☐ work-please specify:

    ☐ other-please specify:_____

12. Do you wish to return to Southwest Virginia after you graduate from a four year institution or professional school?

☐ Yes ☐ No

13. Do you feel like there is an adequate job market in this area for someone graduating with your major?

☐ Yes ☐ No

14. Do you feel like there is an adequate choice of 4-year colleges/ universities and professional schools in this area (Southwest VA, East TN, WVA) that offer your desired major?

☐ Yes ☐ No

15. After you graduate, how confident are you that you could get a job in Southwest Virginia in your major?

☐ very confident ☐ somewhat confident

☐ not confident

16. After you graduate, how confident are that you can get a job in your major if you are willing to relocate?

☐ very confident ☐ somewhat confident

☐ not confident

17. What are any barriers you have encountered in pursuing a STEM major?

☐ financial barriers ☐ family obligations

☐ work conflicts ☐ inadequate high school preparation

☐ lack of support from family ☐ other-please specify_____

18. What are any barriers you think you may encounter in the future as you pursue a career in a STEM field?

☐ few job opportunities ☐ need to relocate to find a job

☐ low salary ☐ high stress

☐ gender barriers ☐ confidence in my ability to be successful

☐ other-please specify_____

Thank you for your participation!

APPENDIX C: SURVEY RESULTS

Question 1: "Did your high school offer any specialized classes in STEM fields that helped prepare you for your major?" (Students were asked to select all that applied.)

Response	Results	Percent
Pre-Calculus	n=18	86%
Calculus	n=13	62%
Engineering	n=5	24%
Anatomy	n=11	52%
Advanced Chemistry	n=5	24%
Computer Science	n=3	14%
Statistics	n=1	5%
Advance Biology	n=3	14%
Physics	n=9	43%

Question 2: "What are any barriers you have encountered in pursuing a STEM major?"

Response	Results	Percent
Financial Barriers	n=3	14%
Family Obligations	n=2	10%
Work Conflicts	n=8	38%
Inadequate High School Preparation	n=9	43%
Lack of Family Support	n=1	5%
Other	n=4	19%
None	n=2	10%

Question 3: "After you graduate, how confident are you that you can get a job in your major in Southwest VA?"

Response	Results	Percent
Very Confident	n=6	29%
Somewhat Confident	n=8	38%
Not Confident	n=7	33%

Question 4: "After you graduate, how confident are you that you can get a job in your major if you are willing to relocate?"

Response	Results	Percent
Very Confident	n=16	76%
Somewhat Confident	n=5	24%
Not Confident	n=0	0%

Question 5: "What are any barriers you think you may encounter in the future as you pursue a career in a STEM field?" (Students were asked to select all that applied.)

Response	Results	Percent
Few job opportunities	n=5	24%
Need to relocate to find a job	n=12	57%
Low salary	n=2	10%
High Stress	n=11	52%
Gender Barriers	n=1	5%
Confidence in my ability to be successful	n=5	24%

Question 6: "What do you think are the best parts about the NSF STEM scholarship program?" (Students were asked to select all that applied.)

Response	Results	Percent
It pays for tuition/books	n=20	95%
It allows you to meet other students with similar interests	n=15	71%
It provides opportunities for visits to transfer schools	n=18	86%
It provides opportunities to hear guest speakers	n=14	67%
It provides mentoring from science, engineering and math faculty	n=11	52%

Question 7: "How did you find out about the NSF STEM scholarship program at SWCC?" (Students were asked to select all that applied.)

Response	Results	Percent
SWCC Website	n=5	24%
High School Counselor	n=5	24%
SWCC Faculty	n=8	38%
Other	n=6	28%

ABOUT THE AUTHORS

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