

Speak Up STEM

The Importance of Reaching Girls and Underserved Students

Data confirms that a sub-set of our student population needs special attention and access if we are to grow a next generation of STEM-career professionals.

By Julie Evans, CEO, Project Tomorrow

Girls, in particular, and underserved students, in general, need special care and attention if they are going to be drawn into STEM-related careers. That’s what the data from Project Tomorrow®’s Speak Up 2013 National Research Project demonstrates*.

In the fall 2013, 180,838 students in grades 6-12 representing schools in all 50 states and the District of Columbia completed an online Speak Up survey at the direction of their school or district. The data provided here is national data that has been analyzed through a variety of different lens and was tested for statistical significance.

The picture that emerges from this data show us that girls’ interest in STEM and STEM-related topics lags far behind their boy counterparts, and that underserved students actually have interest equal to that of other students, but not necessarily the access to information and inspiration about such careers.

General STEM career interests

In terms of a future career in a STEM field, students were polled about their current level of interest. The data is aggregated to indicate the following levels:

- *Not interested* in a STEM career field
- *Somewhat or maybe* interested in a STEM career field
- *Very interested* in a STEM career field

Table 1: What is your current interest in a future STEM career?

	Gr 6-8 Students	Gr 9-12 Students
Not interested	33%	35%
Somewhat/Maybe interested	46%	41%
Very interested	22%	24%

Source: Project Tomorrow

As we can see, the highest percentage of students say that they are “somewhat or maybe interested” in a STEM career field. Too often, programs and initiatives to acquaint students to STEM careers focus on the students who already indicate an interest, in this case the 22 percent of middle school students and the 24 percent of high school students. For activities that require a self-selection process, such as competing in an after-school robotics event, the students most likely to participate are those who already have an interest and are looking to deepen it. The “somewhat/maybe” students (as we call

them) are less secure in their STEM knowledge and are often seeking more comfortable and less competitive ways to explore an emerging interest. We believe that greater attention should be paid to the “somewhat/maybe” students in the pipeline.

It is also interesting that the percentage of middle and high school students who say that they are “very interested” in a STEM career has had changed very little in the several years of polling students on this topic, as noted in Table 2.

Table 2: How has the % of high school students interested in a STEM career changed since 2007?

	2013	2012	2011	2010	2009	2008	2007
Very interested	24%	23%	23%	23%	23%	21%	21%
<i>Source: Project Tomorrow</i>							

Given the tremendous national interest in STEM and STEM-career awareness over the past seven years, an increase of three percentage points is a disappointing return on those investments.

So, what could be the underlying reason for this lack of increase in students’ STEM career interests?

One explanation may be to look at the various sub-sets of the data such as by gender, type of community (urban, rural and suburban), and high home-poverty rates (indicated by the school’s Title 1 status) to understand specific cohort’s interest levels.

Gender differences

First, it is important to recognize that girls are still less likely than boys to view their technology skills as advanced. This difference is important to the discussion on STEM career awareness and recruitment as it supports the idea that girls have less self-confidence in their abilities with technology, an important component within many STEM fields.

Table 3: How would you rate your technology skills compared to your peers?

	Girls – Gr 6-8	Boys – Gr 6-8
Advanced	18%	30%
Average	77%	64%
Beginner	5%	6%
<i>Source: Project Tomorrow</i>		

Girls are also less likely to say that they are “very interested” in a STEM career and more likely to say that they are “not interested.”

Table 4: What is your current interest in a future STEM career?

	Gr 6-8 Students		Gr 9-12 Students	
	Girls	Boys	Girls	Boys

Not interested	39%	26%	41%	28%
Somewhat/Maybe interested	46%	46%	40%	43%
Very interested	15%	28%	19%	29%
<i>Source: Project Tomorrow</i>				

The gender differences in girls’ and boys’ interest in STEM careers also play out in terms of how they want to explore and learn about these careers. According to the Speak Up data, girls are more interested than boys in STEM career-awareness experiences that have a humanistic component and involve a social learning environment. Girls also have a greater interest than do boys in understanding their strengths and weaknesses with regards to STEM fields, supporting the previously shared data about their lack of self-confidence in technology.

Table 5: How do you want to learn about or explore STEM career fields?

Activities to support STEM career awareness/interest	Girls – Gr 6-12 - % who indicated they would like to do this	Boys – Gr 6-12 - % who indicated they would like to do this
Take field trips to companies to meet with career professionals	53%	43%
Play an online or video game to learn about a STEM career	25%	29%
Take a self-assessment test to learn about personal fit for STEM fields	33%	25%
Have a part time job or summer internship in a STEM field	32%	23%
Work with career mentors to learn about potential STEM fields	29%	21%
<i>Source: Project Tomorrow</i>		

Community differences

The difference in interest level among students from different types of communities is surprisingly little. There is, for example, just a four percentage point difference between suburban high school students and Title 1 school students who are "very interested" in STEM careers (compared with a 10 percentage point difference between high school boys and girls).

Table 6: What is your current interest in a future STEM career?

	All Gr 9-12 Students	Gr 9-12 Students – Urban	Gr 9-12 Students – Rural	Gr 9-12 Students – Suburban	Gr 9-12 Students – Title 1 Schools

Not interested	35%	34%	36%	35%	35%
Somewhat/Maybe interested	41%	42%	42%	40%	43%
Very interested	24%	24%	22%	25%	21%
<i>Source: Project Tomorrow</i>					

What these figures suggest is that stereotypes about the STEM interest of minority, poor, or otherwise underserved students are not necessary based in reality. Underserved students have the same interest in STEM as a career as their more advantaged peers, but by and large their access to information about these careers and their exposure to career professionals lags far behind other students. As we have learned from our STEM career awareness programs with disadvantaged youth, students have a strong desire to have more advanced math and science classes at their school and gain real-world level exposure to STEM careers through in school and out of school programming. Programs like Nepriis, that bring STEM professionals into the classroom, can make a tremendous difference in helping these students see what these careers look like in the flesh, bringing the possibility of such a pathway from the abstract to the concrete.

Get them while they are young[er]

Finally, we can infer across the data that a higher percentage of students in middle school indicate a level of “somewhat or maybe” interest in STEM compared to their high school counterparts. This finding tells us that there is a need for more attention to be paid in the middle school years on nurturing that emerging interest level, especially for girls and for students in underserved areas.

This country has put a tremendous effort into attracting students to study and careers in STEM. Our data tells us that there is still much work to be done. Concentrating on middle school students when their potential interest is highest, addressing the girl-boy confidence gap, and providing more and better opportunities for underserved students to see what a STEM career looks like: all of these efforts will go a long way towards building our next generation of STEM professionals.

* Speak Up 2014 data will be available in February 2015. For more information, visit tomorrow.org.