



AHEAD OF WHAT'S NEXT.

STEM Perceptions: Student & Parent Study

Parents and Students Weigh in on How to Inspire the Next Generation of Doctors, Scientists, Software Developers and Engineers

Commissioned by Microsoft Corp.

Introduction

As part of its broader efforts to help improve STEM education, Microsoft Corp. commissioned two national surveys with Harris Interactive among college students pursuing science, technology, engineering and math (STEM) degrees, and parents of K–12 students. The goal of the surveys was to gain insight about what can better prepare and inspire students to pursue post-secondary education in STEM subjects. In these surveys, parents and students were asked about their perceptions and attitudes of STEM education in the U.S., shedding light on how to inspire more young people to become doctors, scientists and engineers.

For more information on Microsoft's STEM commitments, please read our [press release](#).

Note: Survey research methodology is detailed in the appendix of this report.

Executive Summary: Parent Perceptions

Parents were asked about their perception of STEM education in K–12, and the survey found broad agreement that there is room for improvement.

- While most parents of K–12 students (93%) believe that STEM education *should* be a priority in the U.S., only half (49%) agree that it actually is a top priority for this country.
- Parents who feel that STEM should be a priority feel this way because they want to ensure the U.S. remains competitive in the global marketplace (53%) and to produce the next generation of innovators (51%); fewer say it's to enable students to have well-paying (36%) or fulfilling careers (30%).
- Even though many parents (50%) would like to see their children pursue a STEM career, only 24% are extremely willing to spend extra money helping their children be successful in their math and science classes.

Executive Summary: Student Perceptions

College students pursuing a STEM degree were asked to rate how well their K–12 education prepared them for their college courses in STEM, and *why* they chose to pursue a STEM academic path.

Importance of K–12 Education:

- For many, the decision to study STEM starts before college.
- Nearly 4 in 5 STEM college students (78%) say that they decided to study STEM in high school or earlier. One in five (21%) decide in middle school or earlier.
- More than half (57%) of STEM college students say that, before going to college, a teacher or class got them interested in STEM.
 - This is especially true of female students (68% vs. 51% males), who give “a teacher or class” as the top factor that sparked their interest.

Preparedness:

- Only 1 in 5 STEM college students feel that their K–12 education prepared them extremely well for their college courses in STEM.
- Students who felt less prepared for STEM college courses said that offering more STEM courses and having better/more challenging courses would have helped to better prepare them — and for students who felt extremely/very well-prepared, it was the challenging, college-prep courses that helped to prepare them.
- Females in STEM are more likely than males to say they were extremely/very well-prepared (64% vs. 49%) by their K–12 education, and they are slightly more likely than their male counterparts to say that preparing students for STEM should be a top priority in K–12 schools (92% vs. 84%).

Executive Summary: Student Perceptions

Motivation:

- Based on the college student survey findings, the motivation to pursue STEM studies did not originate from their parents telling them to select that subject area or even because they know the U.S. is in need of STEM graduates.
- Rather, students indicate they are selecting a STEM path to secure their own futures.
 - 68% say they want a good salary.
 - 66% say it's the job potential.
 - 68% say they find their degree program subject intellectually stimulating and challenging.

Gender Differences:

- The inspiration for choosing STEM varied quite a bit between males and females.
 - Male students are more likely to pursue STEM because they have always enjoyed games/toys, reading books, and/or participating in clubs that are focused on their chosen subject area (51% vs. 35% females).
 - Female students are more likely to say that they chose STEM to make a difference (49% vs. 34% males).

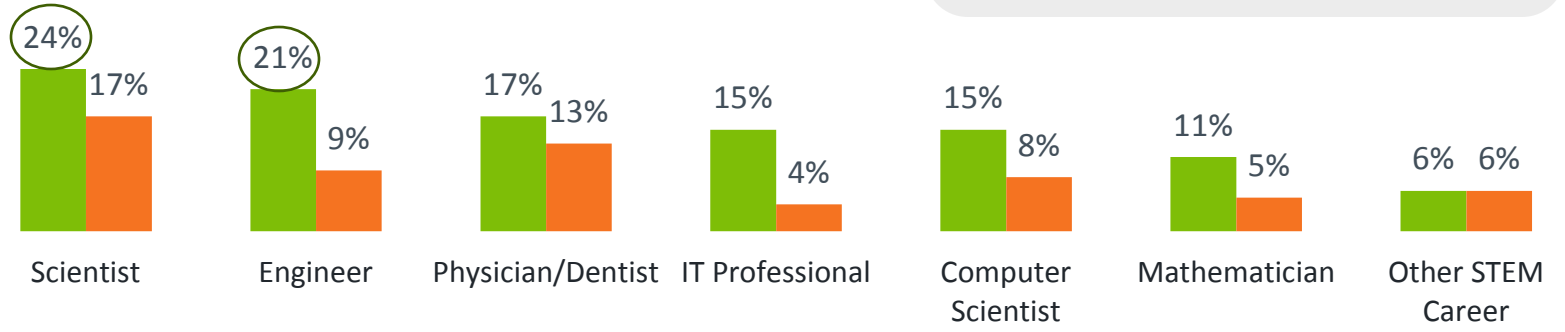


SURVEY FINDINGS

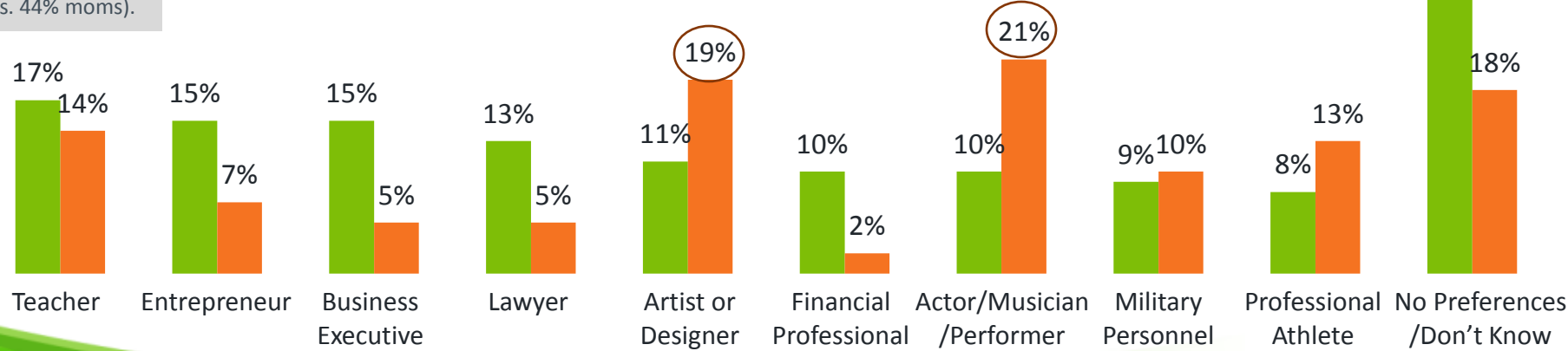
Among careers tested, the two careers parents most want their child to pursue are scientist and engineer; overall, half of parents say they would like their child to pursue a STEM career. On the other hand, parents think their kids are more interested in becoming performers or artists.

Parent and Child Career Hopes
Reported by parents; top responses shown

Parents who give their child's school an "A" on its ability to prepare students for careers in STEM are more likely to say their child wants to pursue a STEM career (52% vs. 38% give school a "B" or lower).



■ I want my child to pursue ■ My child wants to pursue



Base: All Parents of Child in Grades K-12 (n=854)

Q1020: Which of the following careers, if any, would you like your child to pursue? Which of the following, if any, do you think your child will want to pursue?

Parents and STEM students agree that there is room for improvement in K–12 STEM education — only 1 in 5 STEM students feel they were extremely well-prepared for their college STEM courses.

STEM College Students: How Well Did Your K–12 Education Prepare You for College?

- Extremely well
- Very well
- Somewhat well
- Not well at all
- Not sure



Females in STEM are more likely than males to say they were extremely/well-prepared (64% vs. 49%)

What did your school do to help prepare you?

“AP courses were offered at my high school so I was able to gain a good foundation in Calculus and Physics.”

“My schools prepared me for college workloads by sometimes giving college entry level work. Also quite often we would be given opportunities to take a college course or something of that sort.”

What could your school have done to better prepare you?

“More in-depth curriculum.”

“Offer more AP courses and also more opportunities for hands-on experience and programs with each field.”

“More application, less theory.”

REPORT CARD	
Parent Rating of K–12 STEM Prep	
<u>Grade</u>	<u>Total Parents</u>
A	28%
B	41%
C	22%
D	7%
F	3%
Average Grade: B	

Base: All Qualified Respondents (College Students: n=500, Parents of Child in Grades K–12: n=854)

Q910: How well did your K–12 education (elementary through high school) prepare you for your college courses in science, technology, engineering and/or math?

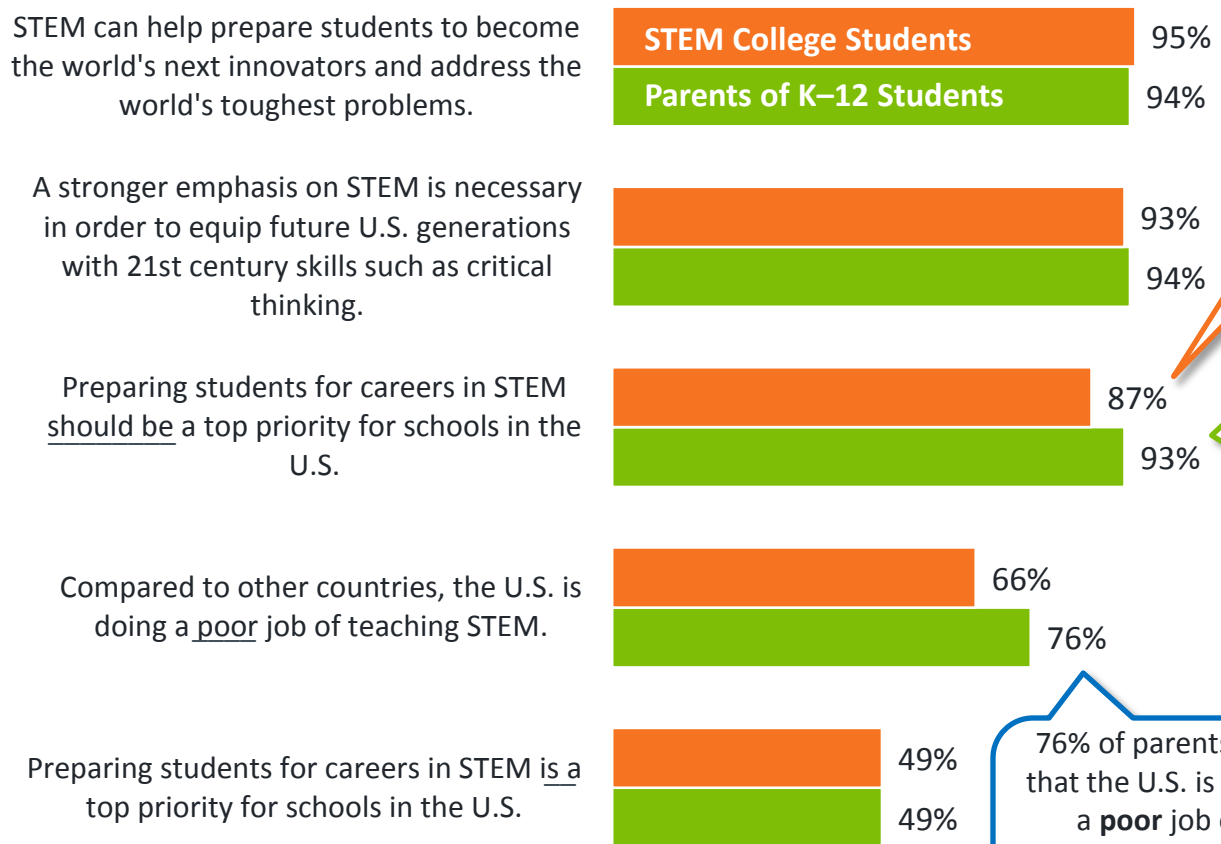
Q915: What could your school have done to better prepare you/What did your school do that helped prepare you for your college courses in STEM? (OPEN END)

Q1055: What grade would you give your child’s school on its ability to prepare students for careers in science, technology, engineering and/or mathematics?

The majority of college students and parents believe that preparing students for careers in STEM should be a priority for K–12 schools in the U.S.; however, only half believe it actually is a top priority in schools.

The State of STEM Education in the U.S.

% agree among students and parents



Female students are more likely than their male counterparts to say that preparing students for STEM should be a top priority in K–12 schools (92% vs. 84%) — another indication of how important K–12 education is for girls.

While parents may feel that K–12 schools are not meeting expectations when it comes to STEM, many are not extremely willing to spend their own money helping their children be successful in their math and science classes (**24% extremely willing** vs. 37% very willing, 34% somewhat willing, and 5% not at all willing).

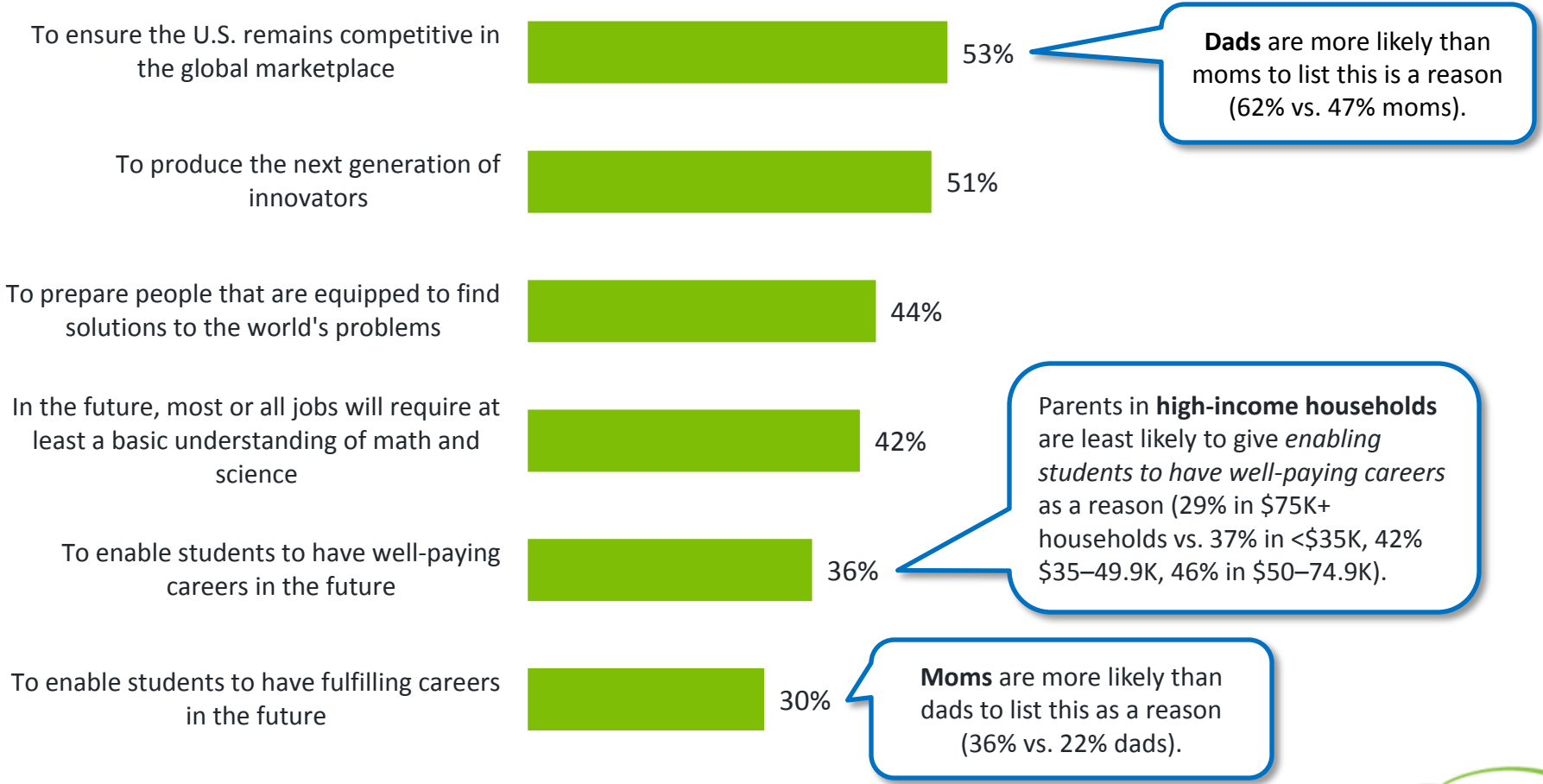
76% of parents feel that the U.S. is doing a **poor** job of teaching STEM compared to other countries.

Base: All Qualified Respondents (College Students: n=500, Parents of Child in Grades K-12: n=854)
 Q940/Q1060: How strongly do you agree or disagree with each of the following statements?
 Q1050: How willing would you be to spend extra money to help your child(ren) be successful in their math and science classes?

So why do parents feel that STEM education should be a priority? About half say it's to ensure that the U.S. remains competitive in the global marketplace and also to produce the next generation of innovators. Preparing students to have well-paying and fulfilling careers are less important.

Parents: Why Should Preparing Students for STEM Careers Be a Top Priority for Schools in the U.S.?

Up to 3 responses selected

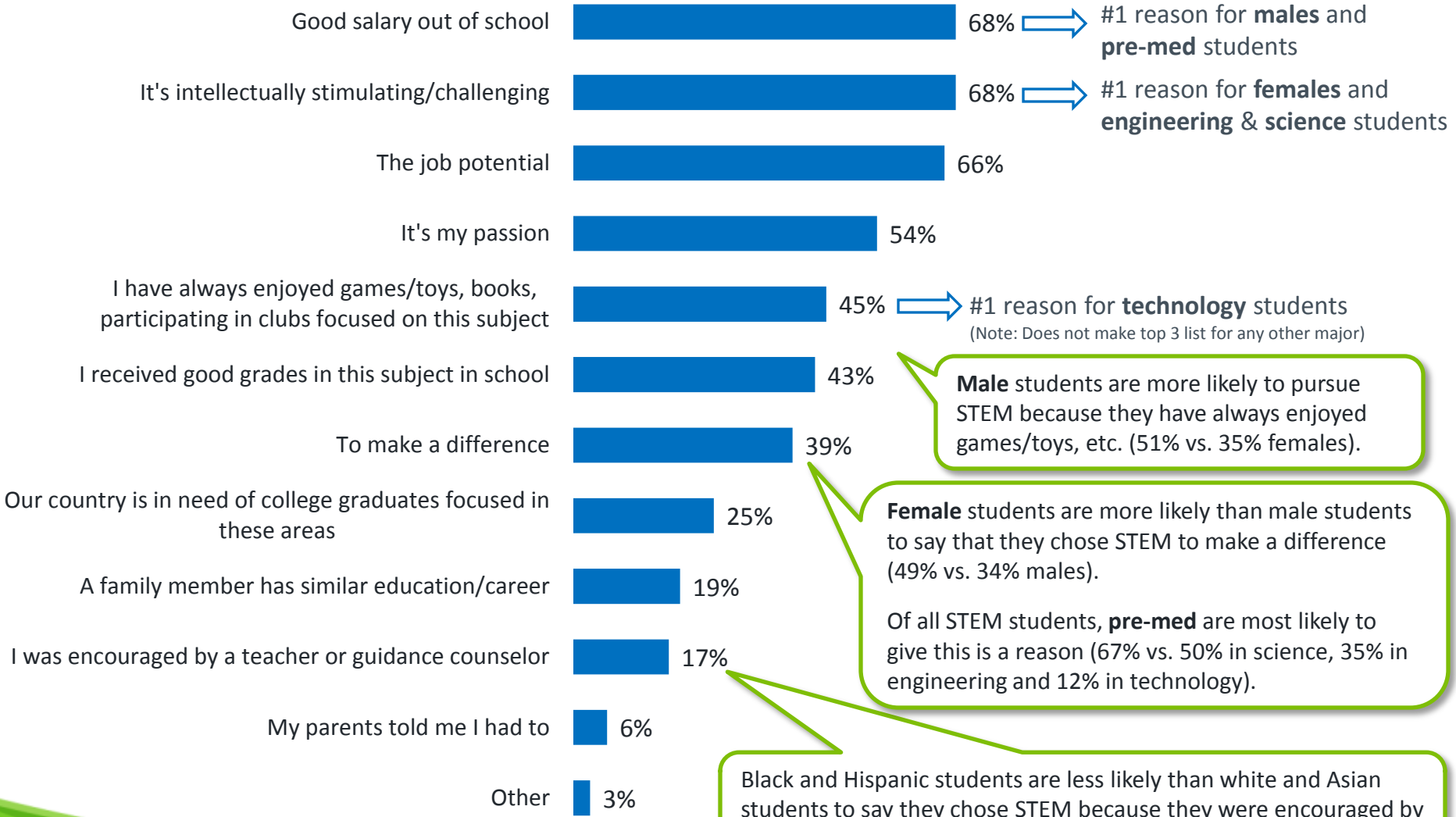


Base: Parents who agree that STEM preparation should be a top priority for schools (n=774)

Q1065: Why do you think preparing students for careers in STEM should be a top priority for schools in the United States. Please select up to three responses.

Students are choosing to pursue a STEM degree, not because someone encouraged or told them to or even because the U.S. is in need, but to secure their own futures and because they find it intellectually stimulating/challenging.

Reasons College Students Choose STEM Degrees



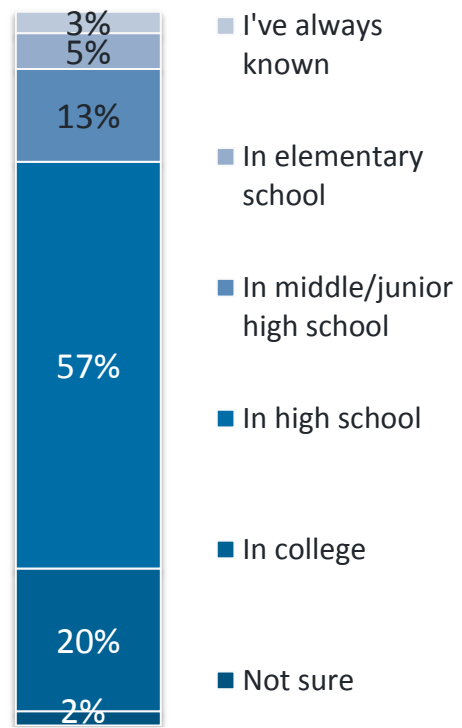
Nearly 4 in 5 STEM college students say that they decided to study STEM in high school or earlier, and parents say STEM interest begins at an early age.

Parents: What Is Your Child’s Favorite Subject in School?

Subject	Percentage	Average Age INTEREST Began
STEM subject (in total)	31%	8.2
Mathematics	14%	7.2
General Science	6%	7.5
Biology	4%	*
Computer science	3%	*
Physics	2%	*
Chemistry	1%	*
Other STEM subject	1%	*
Art	13%	6.3
Reading	9%	4.9
Gym/Physical Education	8%	5.5
History	7%	9.4
Music	7%	5.2
Don’t know	7%	N/A

*Base is too small to report. Note: other subjects tested include Social Studies, English, Foreign Language and Geography. All had 5% or less as favorite subject.

STEM Students: When Did You DECIDE You Wanted to Study STEM?



Students that felt they were only **somewhat or not at all prepared in K–12 for STEM courses** are more likely to have decided to pursue a STEM degree in college (26% vs. 16% students who were extremely/very well-prepared).

Base: All Parents of Child in K–12 (n=854) Q1035: What is your child’s favorite subject in school?

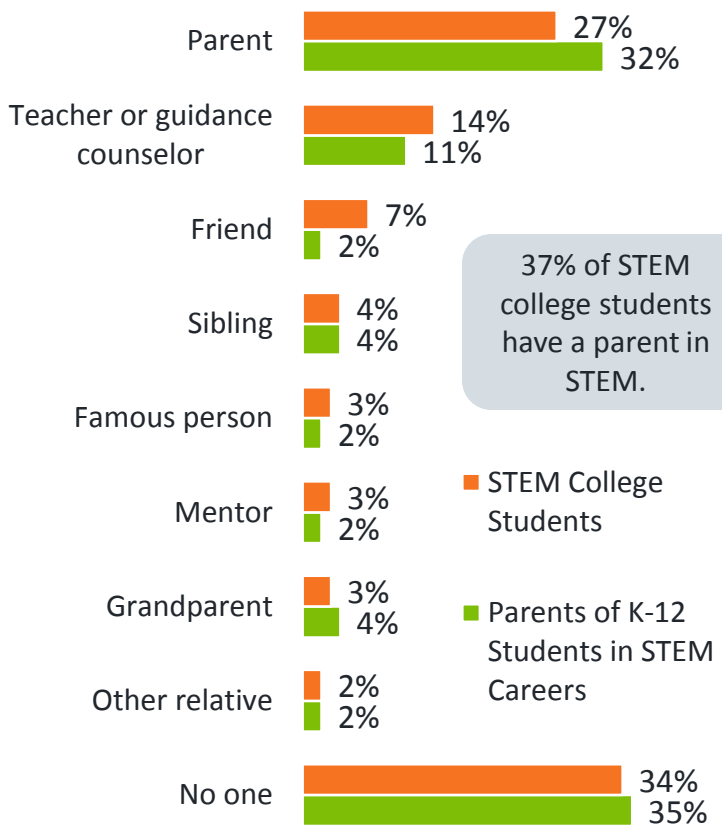
Base: Child has a favorite subject listed (variable base by subject) Q1040: At what age did your child become interested in [FAVORITE SUBJECT]?

Base: All College Students(n=500) Q830: When did you decide that you wanted to be pre-med/to study your area or major in school?

About a third of college students say that no one had the most influence on their decision to pursue STEM — the same is true of parents who are in STEM fields today. However, over half of students say that a teacher or class got them interested in STEM. Half also said that media, games and toys played a role.

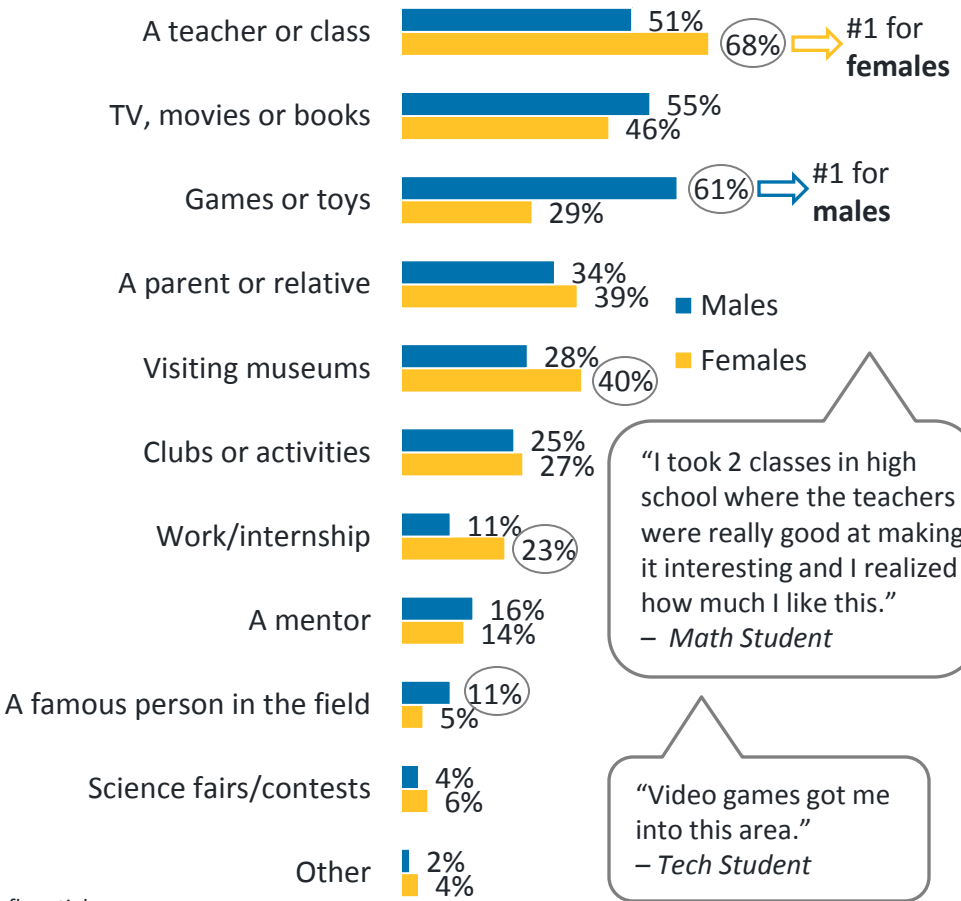
WHO Had the MOST Influence on Your Decision to Pursue STEM?

Reported by students and parents in STEM careers



37% of STEM college students have a parent in STEM.

STEM Students: Before College, WHAT Got You Interested in STEM?



"I took 2 classes in high school where the teachers were really good at making it interesting and I realized how much I like this."
– Math Student

"Video games got me into this area."
– Tech Student

○ = significant difference between males and females.

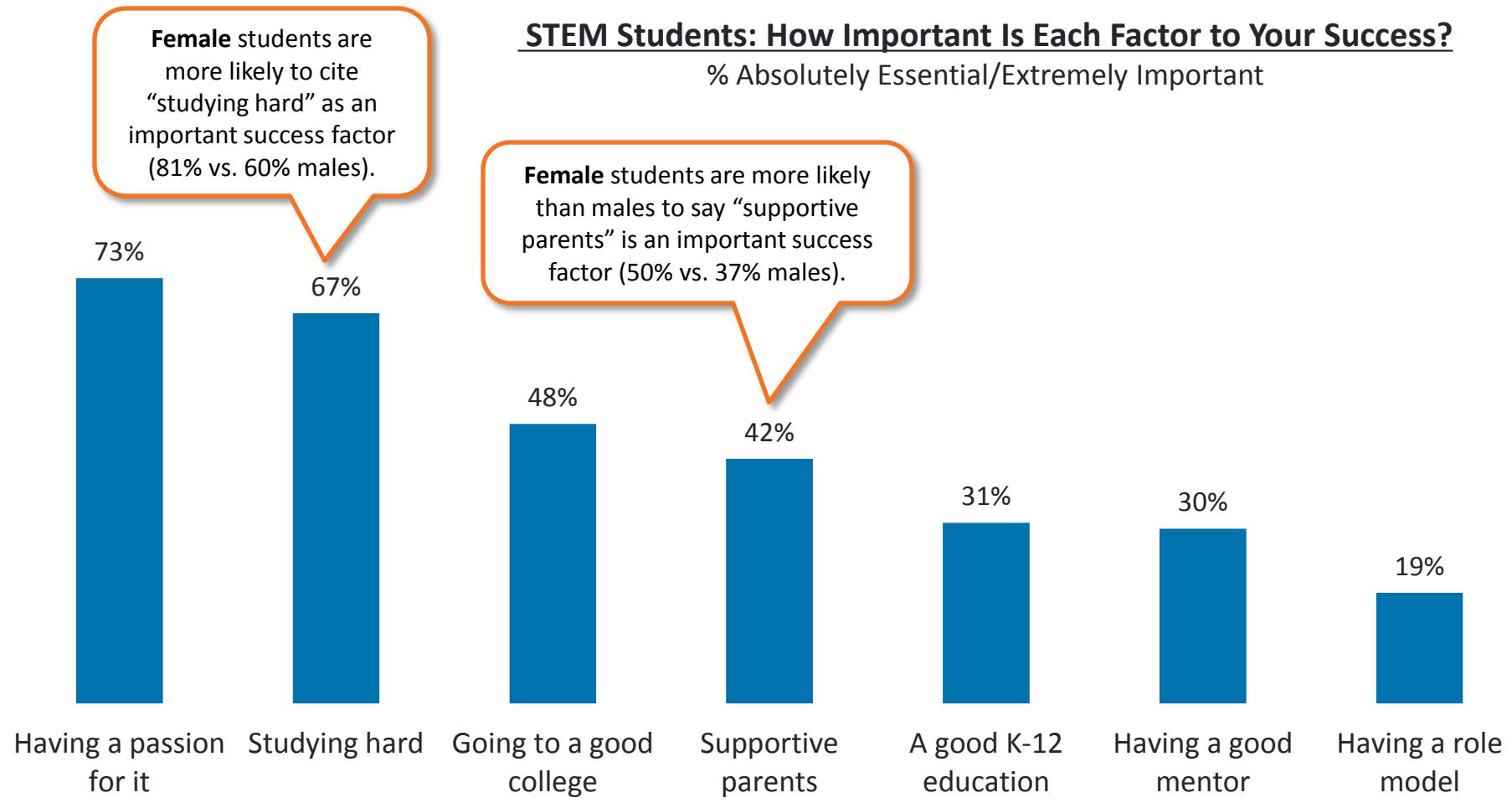
Base: Parents in STEM Careers (n=132) Q1005: When you were a child, who was the most influential person in your life in helping you decide what career to pursue?

Base: All College Students (n=500) Q820: Who had the most influence on your decision to study in this area?; Q840: Before going to college, which of the following got you interested in science, technology, engineering and/or mathematics?; Q845: Please tell us specifically what got you interested in science, technology, engineering and/or mathematics.

Although a good K–12 education is necessary for building a foundation and interest in STEM, students say that having a passion for STEM and studying hard are the two most important factors to their success. External factors, such as K–12 education, mentors and role models, are less important.

STEM Students: How Important Is Each Factor to Your Success?

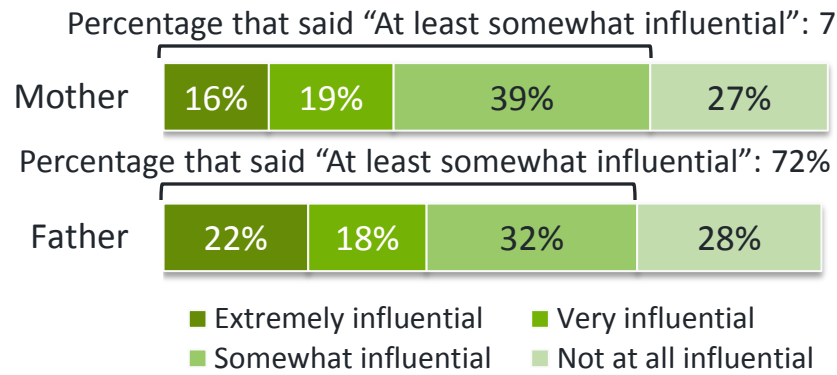
% Absolutely Essential/Extremely Important



Nearly three-quarters of STEM students report that their parents had at least some influence on their decision to study STEM; many parents *want* their child to pursue a STEM career and almost none discourage it.

Students: Parent Influence and Encouragement

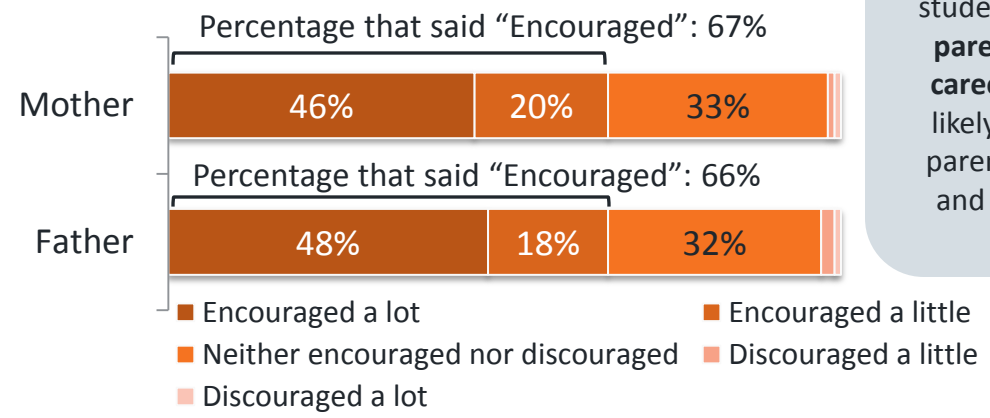
How influential were your parents on your decision to study STEM?



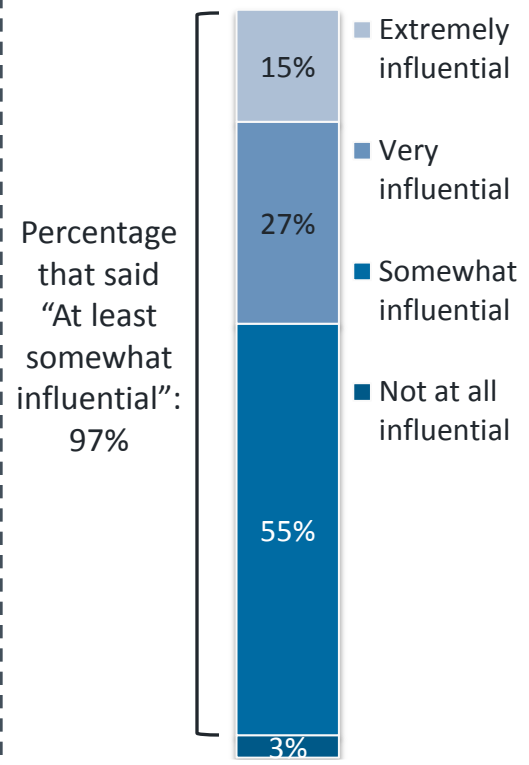
Females more likely than males to say their mother was extremely influential and encouraged a lot.

While few parents have discouraged STEM careers, students who have parents in STEM careers are more likely to say their parent influenced and encouraged them.

Growing up, to what extent did your parents encourage or discourage you from pursuing a career in STEM?



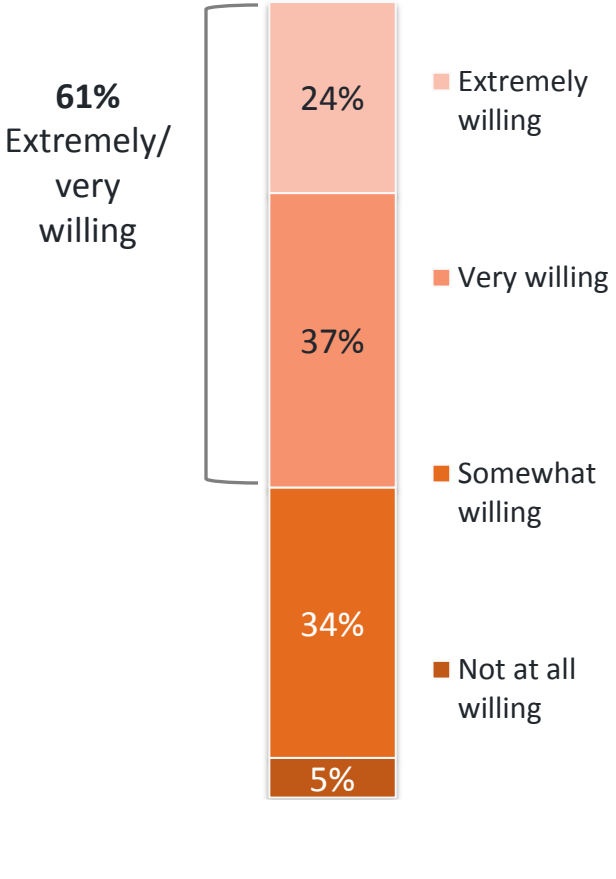
Parents: How influential do you think you will be on your child's future career path?



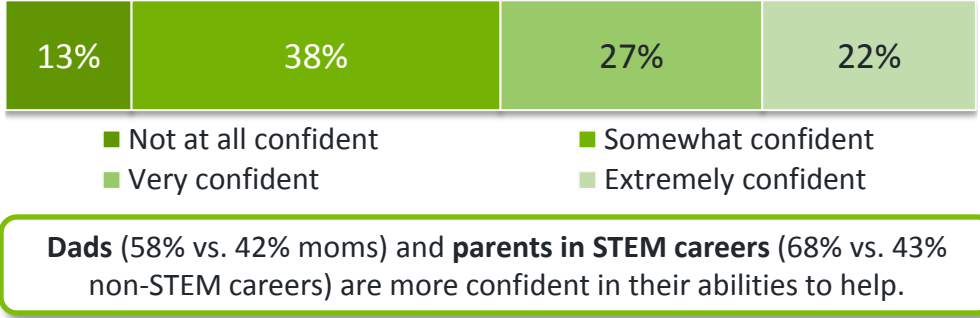
Base: College Students with mother/father in life (variable base) Q880: How influential were your mother and father on your decision to be pre-med/to study in your area or major? Q890: When you were growing up, to what extent did you mother and father encourage or discourage you from pursuing a career in science, technology, engineering or mathematics? Base: All Parents of Child in Grades K-12 (n=854) Q1015: How influential do you think you will be on your child(ren)'s future, specifically the career path they may decide to pursue?

Parents have high, unmet expectations for schools when it comes to STEM education, but are they willing to help make up the difference themselves?

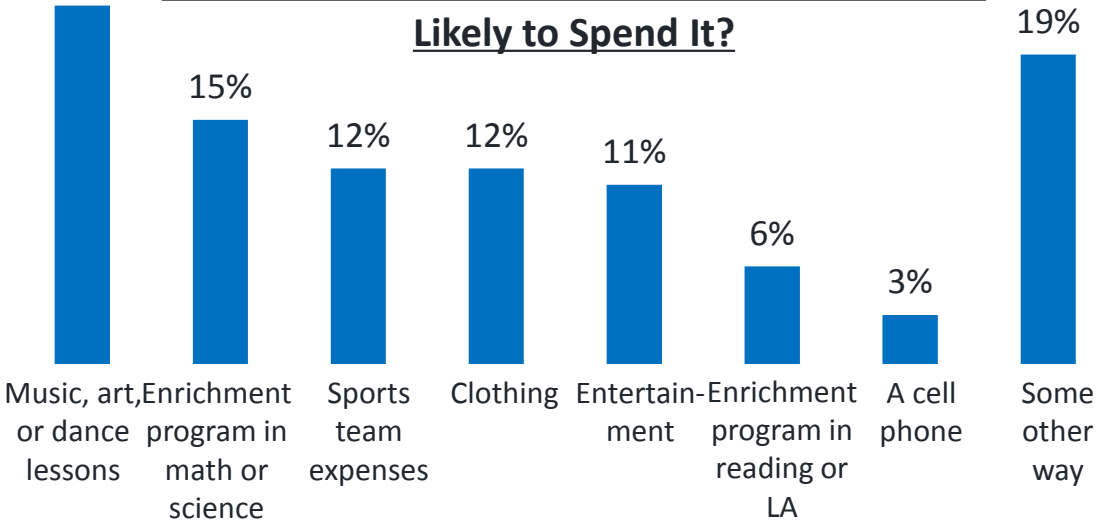
Parents: How Willing Would You Be to Spend Money to Help Your Child Be Successful in Math and Science?



Parents: How Confident Are You Helping Your Child With Their Math and Science Homework?



Parents: If You Had an Extra \$100 to Spend Each Month on Your Child, How Would You Be Most Likely to Spend It?



Base: All Parents of Child in Grades K-12 (n=854)

Q1045: How confident are you that you have the skills to help your child with their math and science homework if they asked for your assistance?

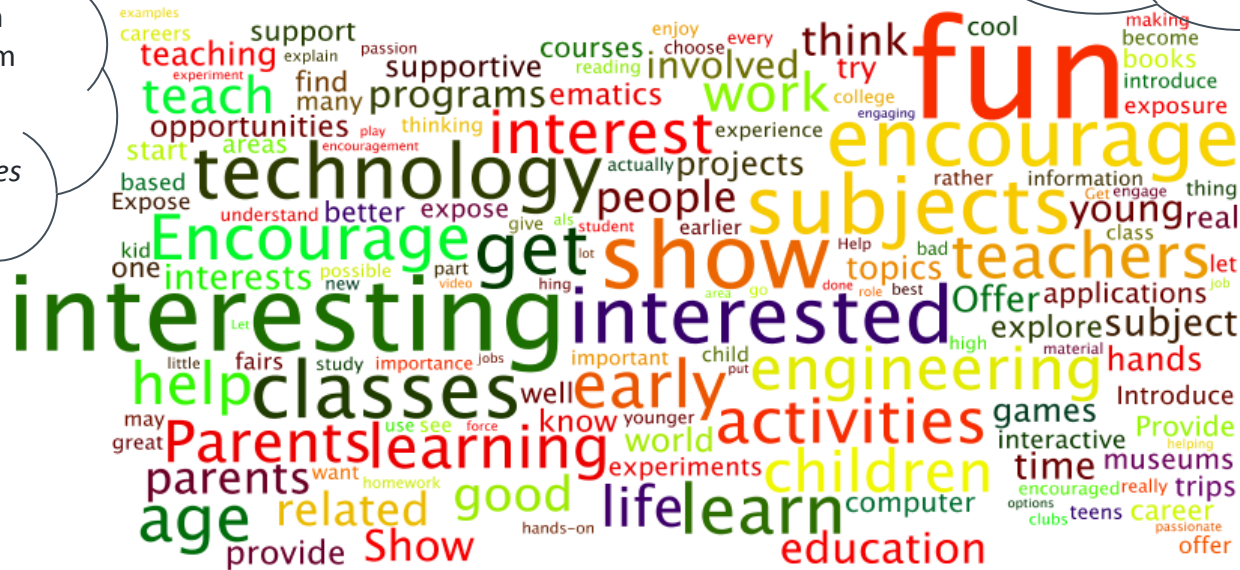
Q1050: How willing would you be to spend money to help your child(ren) be successful in their math and science classes?

Q1030: Assuming all of your child's basic needs are met, if you had an extra \$100 to spend each month on your child, in which of the following ways would you be most likely to spend that money?

STEM Students: What Can Parents and Schools Do to Help Kids and Teens Become Interested in STEM?

“Fun games — see how science, technology, engineering, and mathematics are actually applicable to real life.”
—Engineering Student

“Expose them at an early age, show them it is fun and interesting.”
—Biomedical Sciences Student



“Parents can be more hands on and supportive in teaching their children outside of school to help reinforce what is learned in school. Schools should also have a lot more hands on and visual learning rather than always reading from the textbook. For example, instead of reading about photosynthesis take the students outside and show them photosynthesis.” —Pre-Med Student

The word cloud illustrates keywords used by students to indicate how parents and schools can make STEM more interesting for kids. Larger words represent higher frequencies while smaller words represent lower frequencies.

Base: All College Students (n=500)

Q950: What can parents and schools do to help kids and teens become interested in science, technology, engineering and mathematics?



APPENDIX

Research Methodology

Two surveys were conducted online within the United States by Harris Interactive on behalf of Waggener Edstrom Worldwide/Microsoft:

- The parent survey was conducted from May 4–11, 2011, among 1,074 parents of children ages 17 or younger using the Harris Interactive ParentQuery omnibus. Total sample responding to Waggener Edstrom Worldwide/Microsoft questions includes 854 respondents. Those answering these questions were parents of K–12 students. Data were weighted to be representative of U.S. adults with 0–17-year-olds in the household.
- The student survey was conducted from May 9–12, 2011 among 500 U.S. undergraduate college students, ages 18–24, who are currently pursuing a STEM degree. Data were weighted to be representative of U.S. undergraduate college students between the ages of 18–24.

All sample surveys and polls, whether or not they use probability sampling, are subject to multiple sources of error, which are most often not possible to quantify or estimate, including sampling error, coverage error, error associated with nonresponse, error associated with question wording and response options, and post-survey weighting and adjustments. Therefore, Harris Interactive avoids the words “margin of error” as they are misleading. All that can be calculated are different possible sampling errors with different probabilities for pure, unweighted, random samples with 100% response rates. These are only theoretical because no published polls come close to this ideal.

About Harris Interactive

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