#### The STEM Gender Gap: Perceptions of girls towards STEM fields and careers

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### What is STEM?

**S** Science

Natural Sciences

Biology Chemistry Physics

Medicine

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Technology

Computer Science

Information Technology

> Data Science

> > . . .

**E** Engineering

Aerospace Engineering

Mechanical Engineering

Electrical Engineering

. . .

M Mathematics

Applied Mathematics

Accounting

**Statistics** 

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## Research Objectives

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To identify the reasons for the students choosing a STEM or a non-STEM pathway to higher education and careers.



To explore the confidence gap issue in girls - STEM vs non-STEM majors and identify possible reasons.

To identify the triggers and barriers for a career in STEM fields.



To understand the influence of role models and their degree of influence in the decision-making process.





# The survey was conducted among Singaporean / PR students aged 16 to 25 to understand their perceptions towards STEM subjects & careers.

## Increase in the intention to pursue STEM majors and careers among students seen

STEM %	Current Major	Potential Major	*Potential Caree
IP/JC	29%	59%	74%
Poly/ITE	56%	59%	67%
University	62%	N.A.	68%
Total	49%	56%	76%

>75% are likely to stick to their current major choices



B1, B3a, B3b, C4 ASK IF A1=3-6: Which subjects or courses are you taking / do you plan to major in in University? MA ASK IF A1=7: Which subjects or courses did you do / are you majoring in University right now? You may select up to 2 options for double major. After you complete your studies, are you planning to pursue a career in STEM field/industry? (STEM = Science, Technology, Engineering, Mathematics) Note: \*Potential career excludes those respondents who are unsure Base: n=600 (Total sample) © 2021 Ipsos.



## **Diverging interests between males and females**





B3c. IF A1=3-6: Please rank your top 3 choices Note: Language major is not shown on chart. Base: n=391 (current students IP/JC/Polytech)



## Window of opportunity for keeping girls interested in STEM subjects is around 15 years of age

Among those who once considered STEM related subjects for higher studies,

#### 1 in 3 girls changed their mind at the age of 15

Change of mind from STEM to non-STEM





B4a. When you were younger, did you ever consider studying STEM related subjects in your higher studies? B4b. At which age did you change your mind about studying STEM related subjects in your higher studies? Base: n=267 (Potential in Non-STEM)



#### **Top reasons for pursuing STEM subjects**

I am very interested in STEM subjects

STEM subjects have great future growth prospects

STEM subjects open doors to high paying jobs in the future





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B5. Which of these describe why you are considering studying STEM related subjects for your higher studies? (STEM = Science, Technology, Engineering, Mathematics) MA Base: n=333 (Potential STEM)

## Why are girls not pursuing STEM subjects?





B4c. Which of these describe why you are NOT considering studying STEM related subjects in your major/ higher education? (STEM = Science, Technology, Engineering, Mathematics) MA Base: n=267 (Potential in Non-STEM)

## > 4 in 5 agree that STEM jobs are high paying (86%) and offers exciting opportunities (85%)

However, fewer females agree that STEM jobs allow them to pursue their interests and offer a good work-life balance

STEM jobs allow me to pursue my interests STEM jobs offer a good work-life balance

Males	Females	
84%	68%	
-		
74%	56%	



C12. The following statements are some general statements related to STEM jobs/careers. Select the extent to which you agree or disagree with each statement. On a scale of 1 to 5, 1 being "Completely disagree" to 5 being "Completely agree". Base: n=600 (Total Sample)



## **1** in **4** girls are unsure of pursuing a STEM career. These could be the reasons ...

	Males	Female	S
Level of understanding about STEM careers (very well aware / somewhat aware)	60%	41%	
Experience in STEM internship	54%	<mark>36%</mark>	



C1. Was it a STEM field related internship? SA Base: n=248 (Current students from Polytech/ITE & uni undergrads) C3. What is your level of understanding about STEM related careers? (STEM = Science, Technology, Engineering, Mathematics) Base: n=600 (Total Sample)



## Majority agree that girls are less likely than boys to choose STEM, and these are the reasons...

	Males	Females
Girls are generally less interested in STEM	36%	49%
STEM jobs tend to have more males than females working in them	34%	<mark>49%</mark>
Society and media generally do not encourage girls to choose STEM jobs	37%	<mark>31%</mark>
Parents generally do not encourage girls to choose STEM jobs	25%	<mark>20%</mark>
Girls are not strong in STEM subjects	15%	<mark>26%</mark>
The working conditions in STEM jobs are not suited to females	10%	<mark>20%</mark>



C7. Do you think the girls are less likely than boys to choose a STEM related career? (STEM = Science, Technology, Engineering, Mathematics) C7a. Why do you say so? Choose all that apply Base: n=600 (Total Sample), n=276 (Those who agree to the statement)



### Girls lack the confidence to pursue STEM careers

	Males	Females
I may not have been qualified enough for the job	33%	<mark>42%</mark>
It might be too competitive /stressful	43%	37%
I might not have the right connections	35%	<mark>24%</mark>



C6. ASK IF CODE NO, NOT SURE IN C4: Why won't you pursue a career in STEM related field? Base: n=600 (Total Sample), Base: n=330 (Potential STEM Careers)



### Girls have lesser industry connections in STEM fields...



do not personally know anyone working in a STEM related field

#### ... hence the need for mentorship and networking



C11. Do you personally know of anyone working in a STEM related field? If yes, who are they? MA (STEM = Science, Technology, Engineering, Medicine) Base: n=600 (Total Sample)



## Traits associated with **STEM** fields

**Good with numbers** 30% **Tech-savvy** Intelligent 28%

29%

## **Traits associated with non-STEM** fields





B0b. Which of the following traits would you describe or associate yourself with? MA Base: n=600 (total sample)



### Girls rate themselves lower in traits associated with STEM



B0a. Which are the following traits are <u>desirable</u> to you? MA B0b. Which of the following traits would you <u>describe or associate yourself</u> with? MA Base: n=600 (total sample)

## **Creativity ranked as the least important skill needed for success in STEM**

Problem solving skills (83%)
Analytical skills (82%)
Attention to details (82%)
Critical thinking (81%)

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10. Creativity (61%)

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C13. On a scale of 1 to 5, 1 being "Not at all important" to 5 being "Very important", to what extent do you think the following skills are important for a successful STEM career? n= 600

ource: https://www.seattlebusinessmag.com/article/making-impression-ten-skills-you-need-land-stem-job



## But Creativity is an important secret sauce in STEM

Nov 30, 2020, 09:02am EST | 1,227 views

#### Creativity Education Is Equally Important For Careers In STEM And The Arts



Alison Escalante Contributor () Science Lurite about the science of performance.



Creativity is a core competency for careers in both the arts and sciences. GETTY



C13. On a scale of 1 to 5, 1 being "Not at all important" to 5 being "Very important", to what extent do you think the following skills are important for a successful STEM career? n= 600 Source: https://www.forbes.com/sites/alisonescalante/2020/11/30/creativity-education-is-equally-important-for-careers-in-stem-and-the-arts/?sh=1f0a925c554f



Girls lean towards Healthcare and Accounting fields, while boys show an inclination towards Tech / T

#### Males

Data Analyst (24%)

Software Engineer (22%)

Computer & IT (21%)

**Computer Programmer (21%)** 

Data Scientist (21%)

## TOP 5 APPEALING STEM CAREERS

#### **Females**

Data Analyst (27%)

Accounting (21%)

Scientist / Researcher (20%)

Healthcare & Medical (19%)

Data Scientist (17%)



C5a. Within a STEM related career, which of these jobs would be appealing to you? MA C5b. Within a STEM related career, which of these jobs would be the most appealing to you? SA



## Parents are the key influencers in their child's future studies and career plans.

## 1 in 4 females consider role models as key influencers

#### Key influence on future study & career plans

	Males	Females
Parents	64%	58%
Peers / Friends / Seniors	60%	<mark>52%</mark>
Siblings	37%	<mark>24%</mark>
Teachers / Counsellors	30%	<mark>30%</mark>
Role model / Mentor	19%	<mark>。28%</mark>



C9. Who would you say has the most influence on your future study and/or career plans? Please rank the top 3, with Rank 1 being the most important influencer. Base: n=600 (Total Sample)

2021 Ipsos.

## WHAT CAN WE DO?





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## Need for intervention at an early age

Consider programs to highlight the more hands-on application of STEM to sustain the girls' interest.

## Peer influence plays an important role

Have programs that focuses on group participation.

## Family plays a crucial role in nurturing child's interest in STEM

Advocacy and activities targeting parents can help raise awareness to boost children's self-confidence and nurture interest in STEM





## **Reposition STEM to highlight the creativity aspect**

Especially in problem solving and innovation aspects

### Make STEM more appealing by moving towards STEAM

Incorporate elements of arts / creativity in STEM to take it to the 'next level'

## Educate on new and exciting STEM career pathways

Raise awareness on STEM career pathways among girls to broaden career choices in STEM

## Inspire the next generation of girls

Leverage on success stories of women in STEM fields and their experiences



EMPOWER GIRLS TO REDUCE STEM GENDER GAP





