STEMP.INC

PASSPORT FOR INCLUSION

STEM PASSPORT FOR INCLUSION

IMPACT REPORT

2021-2024

Maynooth University National University of Ireland Maynooth
Microsoft
Taighde Éireann Research Ireland
An Roinn Oideachais Department of Education
MTU Ollscoil Teicneolaíochta na Mumhan Munster Technological University
Ollscoil Teicneolaíochta an Atlantaigh Atlantic Technological University

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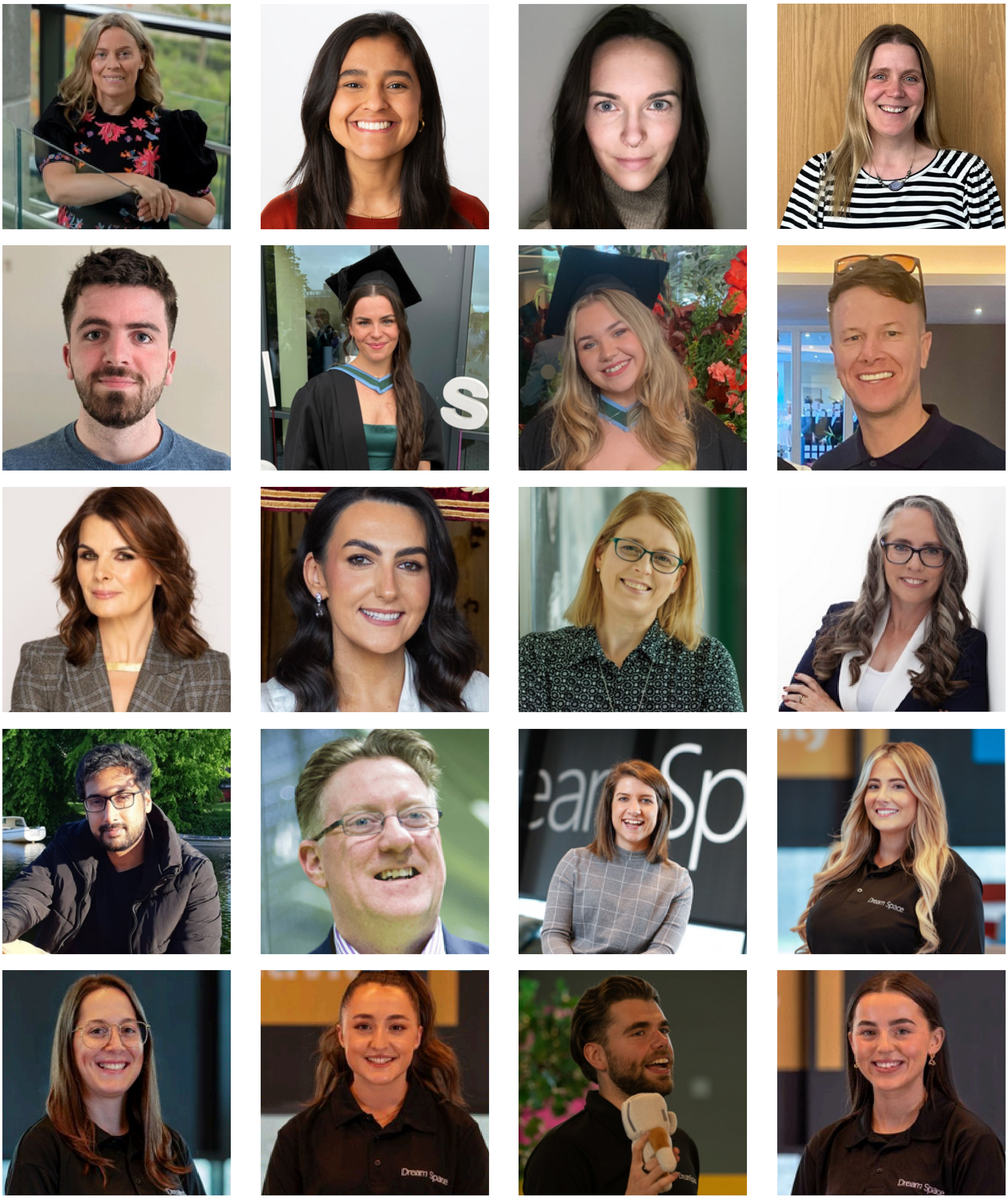
Meet Our Team



> **If everyone is moving forward together, then success takes care of itself** - Henry Ford

Executive Summary

Problem Statement

The STEM Passport for Inclusion aims to address critical disparities in Science, Technology, Engineering and Maths (STEM) education, particularly affecting girls from socioeconomically disadvantaged backgrounds in Ireland. The STEM leaky pipeline describes how many girls and women drop out of STEM pathways due to social, educational, and economic barriers. These barriers are especially challenging for students attending DEIS (Delivering Equality of Opportunity in Schools) institutions, where systemic inequalities reduce access to STEM education, mentorship, and career pathways. Recognising that gender and socioeconomic status often intersect to limit opportunities in STEM fields, this programme was created to bridge these gaps and create a more inclusive STEM landscape.

Programme Overview

The STEM Passport for Inclusion was launched through a partnership led by Dr Katriona O'Sullivan and supported by major stakeholders like Microsoft Ireland, Maynooth University (MU), Research Ireland, the Department of Education and various educational and industry partners. Driven by a commitment to equal opportunity, this initiative seeks to empower young women in DEIS schools by offering STEM skills, mentorship, and industry engagement opportunities. With the programme's vision aligned with national and international policy goals, the aim is to ensure that students from marginalised communities have access to STEM knowledge and pathways that will prepare them for meaningful careers in a rapidly digitising society.

Key Findings and Programme Impact

1. Improved STEM Awareness and Confidence: Surveys conducted with over 5,000 participants revealed notable increases in students' STEM awareness and confidence. For example, only 28% of students knew a woman working in STEM before participating; post-programme, this figure rose to 92%. This awareness shift is crucial in breaking down stereotypes and reshaping students' aspirations.
2. Enhanced STEM Skills and Academic Pathways: The introduction of a Level 6, 5-credit "21st Century STEM Skills" module, developed with Microsoft and Maynooth University, provided students with an accredited qualification in coding, data management, and design thinking.
3. Bridging the Socioeconomic Gap: The programme reached 117 DEIS schools and reported a 70% student completion rate. Students from disadvantaged areas showed the largest increases in confidence and interest in pursuing STEM.
4. Positive Influence of Mentorship: Through the Mentoring for Equality initiative, students engaged in over 2,500 mentoring hours provided by industry professionals. These interactions were pivotal, with many students crediting their mentors for inspiring confidence and providing role models within STEM fields.
5. Broadening Mentor Perspectives and Awareness: Mentorship feedback revealed a heightened awareness of their unconscious biases and a re-evaluation of their preconceptions about who can excel in STEM, reinforcing the programme's broader impact on promoting equality in STEM.
6. Increased STEM Intentions and Career Aspirations: Post-programme analysis showed substantial increases in participants' desire to pursue STEM careers. Students reported feeling that STEM fields were accessible to them, a change linked directly to programme participation.

Executive Summary

Recommendations for Future Impact
To sustain and expand the programme's impact, the report outlines six strategic recommendations:

- Expand the Programme Across All DEIS Schools: By securing funding to implement the programme in every DEIS school, the initiative could ensure nationwide access to STEM education for disadvantaged students.

- Provide Necessary Resources to DEIS Schools: Many schools lacked the resources to fully participate in the programme. Supplying these institutions with loaned technology, mobile lab kits, and internet support would help bridge this resource gap.

- Introduce Funded STEM Work Experience Programmes: Partnering with industry to provide work experiences would enhance real-world learning and skill development. This initiative would be particularly valuable for DEIS students, who often lack exposure to STEM career pathways.

- Fund Longitudinal Research on Programme Impact: By investing in comprehensive research, stakeholders can gain insights into long-term outcomes, enabling data-driven improvements and enhancing the programme's sustainability.

- Establish Stable Funding for Large-Scale, Collaborative STEM Initiatives: Long-term financial support from government and private partnerships is essential to maintain programme stability and enable continued growth.

- Ensure Equal Access to STEM Subjects in Schools Nationwide: Equipping all schools with a full range of STEM subjects would address subject access disparities and create a more inclusive educational environment.

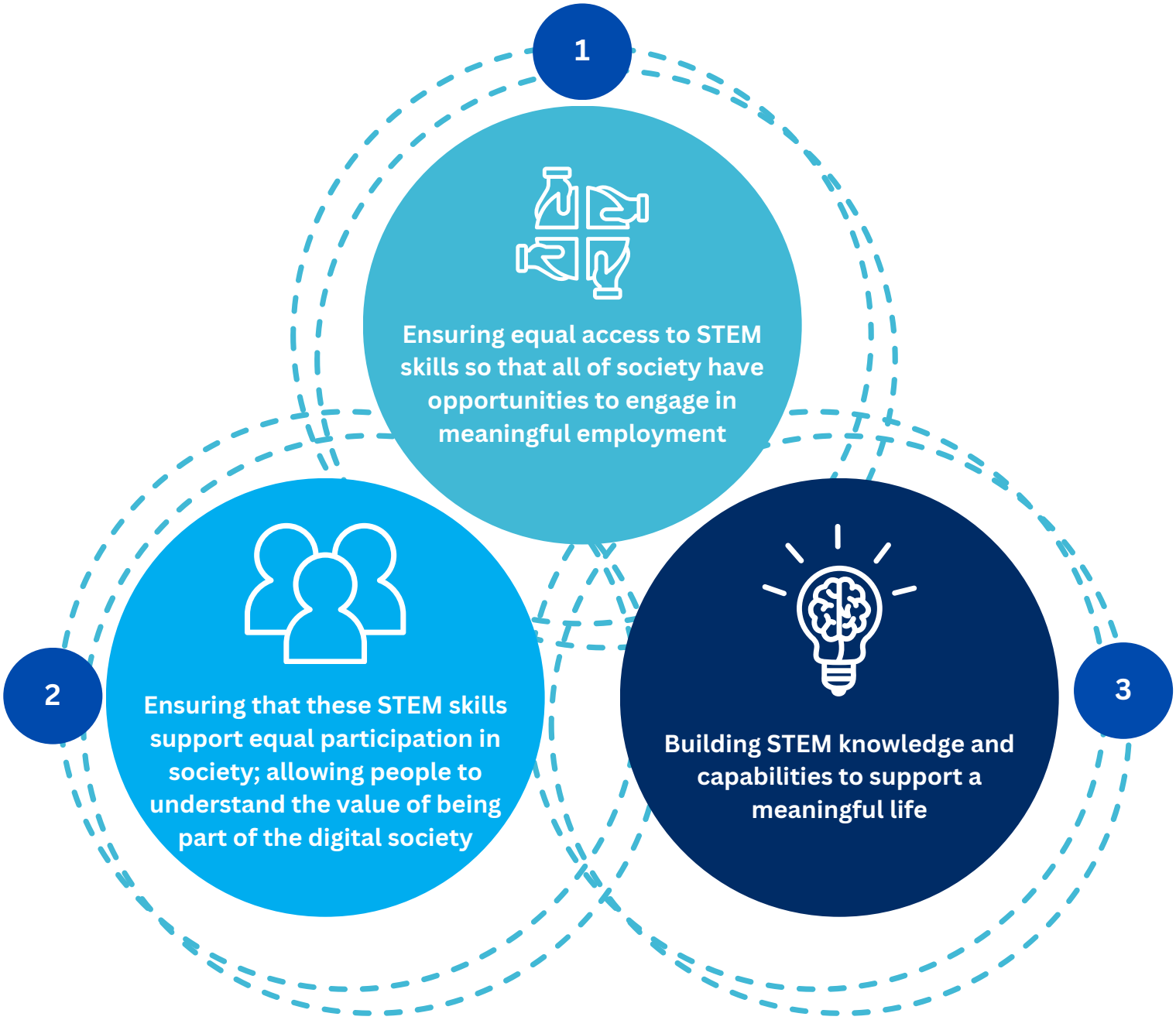
Conclusion
The STEM Passport for Inclusion has been instrumental in transforming STEM education for underrepresented students, especially girls in socioeconomically disadvantaged areas. By offering a structured pathway with mentorship and accredited STEM training, the programme has effectively bridged gaps in knowledge, confidence, and aspirations. As the programme expands, it has the potential to reach every DEIS school in Ireland, fostering a new generation of STEM-ready students who are diverse, skilled, and empowered.

In the coming years, the programme anticipates substantial growth, with increased funding and strategic partnerships paving the way for more comprehensive, sustainable access to STEM education. This transformative approach sets a model for global initiatives, showing that with collective effort, educational equity and inclusive access to STEM are achievable.

Vision

The STEM Passport for Inclusion aims to change the future of STEM by ensuring that all students, irrespective of class or condition, are STEM prepared.

We do this by providing accredited education opportunities and STEM Mentoring to groups of students who are on the margins in terms of STEM education. These include girls in schools with a high concentration of socio-economic disadvantage or DEIS schools - DEIS stands for Delivering Equality of Opportunity in Schools. The STEM Passport for Inclusion has three core priorities that align with national and international policy in equality and STEM education, these priorities are:



Background

The rapid technological advancements of the 21st century demand a broadened focus on STEM education. In Ireland, 30% of students entering higher education for the first time study STEM. The National Skills Strategy (2021) identifies a need to increase STEM participation to develop the talent and skills required for the future of work. Building a strong STEM workforce is critical for global economic growth and innovation.

Gender Inequality

There is a significant gap between this demand and the current education systems' ability to produce a diverse, prepared STEM workforce. In Ireland, despite female students accounting for more than half of third-level students, they only make up 35% of STEM students (Higher Education Authority, 2023b). The gender gap is significant in enrolment in STEM-related courses such as Engineering (73% Male, 26% Female), ICT (80% Male, 20% Female) and Mathematics (66% Male, 32% Female) (Higher Education Authority, 2023c). Gender inequity in STEM jobs is also widespread and persistent – with the Global Gender Gap Report (2023) revealing women represent only 29% of the STEM workforce compared to nearly 50% of the non-STEM sectors. Fields like technology and engineering report the lowest female representation, with women holding just 19% of technology roles and 12% of engineering jobs (STEM Women, 2024).

Social Class

Social class also impacts upon STEM participation. Socioeconomically disadvantaged students are less likely to major in STEM compared to those from higher socioeconomic backgrounds (Shaw & Barbuti, 2010). We see this socioeconomic gap is evident in many countries, including Ireland, where fewer than 1 in 10 third-level graduates in 2020/21 were from disadvantaged backgrounds, and less than 10% of those graduated in STEM fields such as ICT (11%), Engineering (5%), or Mathematics (6%) (O'Shea, 2023). Recent data shows that third-level progression rates for disadvantaged students is the lowest, at 77%, and over 10% below the national average for students from non-DEIS status secondary schools (Lau, 2024).

> **Gender equality is critical to the development and peace of every nation.** - Kofi Annan

Background

Women are not all the same!

Further disparities exist when we consider how gender and social class intersect. In Ireland, we know that working class females are significantly less likely to participate in higher level STEM courses while in post primary school than their male counterparts (HEA, 2019) and more affluent girls (Boyle et al., 2022). These young women are also less likely to apply to STEM degree courses (SUSI, 2019). Research consistently shows that women and girls from low socioeconomic backgrounds face a unique set of barriers that can limit their participation in STEM courses and careers (Christie et al., 2017; Sekuła et al., 2022).

History of the STEM Passport for Inclusion

The STEM Passport for Inclusion was developed as a direct response to the observation that girls from working-class communities, who attend DEIS schools, are unable to access STEM capital in the same way that boys, and their more affluent female counterparts, can. The aim was to develop an evidence based, system solution, to the under-representation of diverse women and girls in STEM. This started in 2020 when Dr Katriona O'Sullivan from Maynooth University partnered with the DreamSpace team in Microsoft Ireland to develop the core ideas behind the STEM Passport. Once established that girls are lacking in social and human capital related to STEM, we began to develop the project and expand our partnership. Dr Helena McMahon (Munster Technological University - MTU), Teen Turn, Accenture, the RDI Hub and Michelle O'Kelly (DEIS principal of Mercy Inchicore Secondary School) became part of the STEM Passport development team and together we developed the first suite of STEM interventions. We conducted the first pilot with girls from Mercy Inchicore Secondary School.

- In 2021, we received our first grant - €300k in direct funding from the Science Foundation Ireland (SFI) Discover grant, alongside the support from Microsoft Dream Space, we were able to roll out the initiative to 1,000 girls across Munster and Leinster.
- In 2023, we secured €600k in philanthropy from Microsoft Ireland which was matched by SFI and the Department of Education through the discover grant. The grant of €1.2 million was used to roll the programme out to 5,000 girls across the four provinces of Ireland.
- In 2023, we adapted the programme for Transition Year students only, expanding the partnership to Atlantic Technological University (ATU), growing mentoring and establishing the Leaving Cert points pathway in both MTU and MU.

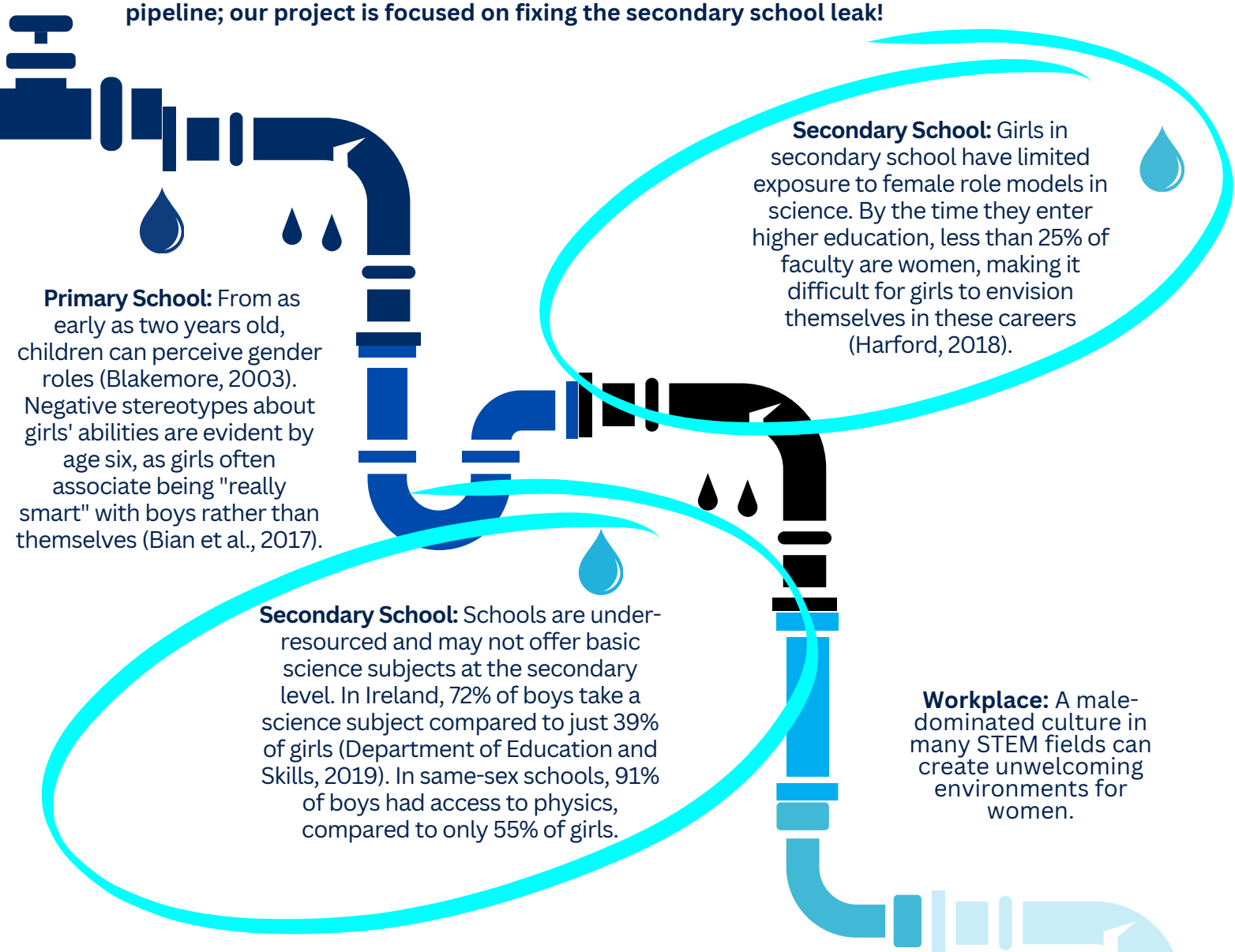
Since 2024, we have raised a further €980k in philanthropy to expand the project in 2025-2027, we have applied for matched funding from the Research Ireland Discover Programme.

> **Success is best when it's shared!**
> - H. Shaltz

The Leaky Pipeline

In the STEM Passport for Inclusion, we use the 'leaky pipeline' metaphor to understand the various points at which girls and women gradually drop out of STEM pathways during different stages of their education and careers. This metaphor illustrates how, despite initial interest and participation, many girls and women leave the STEM pathway due to a variety of factors. In the context of girls in STEM careers, the leaky pipeline starts early, with fewer girls choosing STEM subjects in school due to stereotypes and a lack of encouragement. As they progress, the leaks continue through higher education and into the workforce.

The STEM Passport for Inclusion recognises that there are challenges all across the pipeline; our project is focused on fixing the secondary school leak!



Primary School: From as early as two years old, children can perceive gender roles (Blakemore, 2003). Negative stereotypes about girls' abilities are evident by age six, as girls often associate being "really smart" with boys rather than themselves (Bian et al., 2017).

Secondary School: Girls in secondary school have limited exposure to female role models in science. By the time they enter higher education, less than 25% of faculty are women, making it difficult for girls to envision themselves in these careers (Harford, 2018).

Secondary School: Schools are under-resourced and may not offer basic science subjects at the secondary level. In Ireland, 72% of boys take a science subject compared to just 39% of girls (Department of Education and Skills, 2019). In same-sex schools, 91% of boys had access to physics, compared to only 55% of girls.

Workplace: A male-dominated culture in many STEM fields can create unwelcoming environments for women.

Work-Life Balance: Challenges in balancing work and family responsibilities can lead to higher attrition rates among women in STEM careers.

The motherhood penalty: Refers to the economic disadvantages women face in the workplace after becoming mothers. This includes wage reductions, diminished perceived competence, and fewer career advancement opportunities compared to their childless counterparts.

The Solution

The STEM Passport for Inclusion aimed to ensure every student, regardless of class or condition, leaves school STEM-prepared. We identified that girls in DEIS schools often lacked access to comprehensive STEM subjects, mentors, and pathways to STEM careers. We developed **a system solution** to ensure that our students leave school with STEM skills, mentoring, and industry exposure.

To achieve this vision, a three pronged system solution was developed.

01. UNIVERSITY STEM QUALIFICATION

The Microsoft Dream Space education team, with Dr Katriona O'Sullivan and Maynooth University's science faculty, created a Level 6, 5-credit module called "Introduction to 21st Century STEM Skills" using the UNESCO skill development model. Aimed at senior cycle students, it covers coding, collaboration, data management, and design thinking. The module includes 24 hours of class time and 100 hours of independent study. After international review, it is now nationally recognised and accredited by MU, MTU, and ATU.

02. MENTORING FOR EQUALITY

In partnership with the MU Equality, Diversity, Inclusion and Interculturalism (EDI) office, Dr Katriona O'Sullivan and the STEM team developed the 'Mentoring for Equality' training programme. Launched in 2021 through the National Forum for Teaching and Learning, it became a Level 9 Micro-credential at Maynooth University in 2022. The programme includes 8 hours of training for industry professionals on educational inequality and mentoring diverse students. It aims to foster systemic change by preparing workplaces to support and elevate diverse women into leadership roles.

03. COLLEGE AND CAREER PATHWAY

In 2021, the "Introduction to 21st Century STEM Skills" module was approved by MTU as a pathway to STEM courses at the Kerry campus. Successful students could earn 50 Leaving Cert points for specific MTU courses. In 2023, Maynooth University launched a 5-year pilot of the STEM-DEIS points pathway, allowing students to earn an additional 60 Leaving Cert points for specific MU courses. Students must meet the entry requirements to qualify.

Why We Need STEM Passport

The STEM Passport for Inclusion is an essential solution to the gender disparities which exist within the Irish second level education system. Research shows that girls are less likely to be offered STEM subjects, and that boys dominate in subjects like Physics and Engineering. Our own research shows that there are differences in girls intention to study STEM and their confidence in both Math and Science. **The STEM Passport has been designed to supplement the gap between girls and boys in STEM experiences and opportunities.**

National Data Shows

Female students made up only

35%

of STEM Graduates nationally (HEA 2023)

Gender Differences across third level subjects include

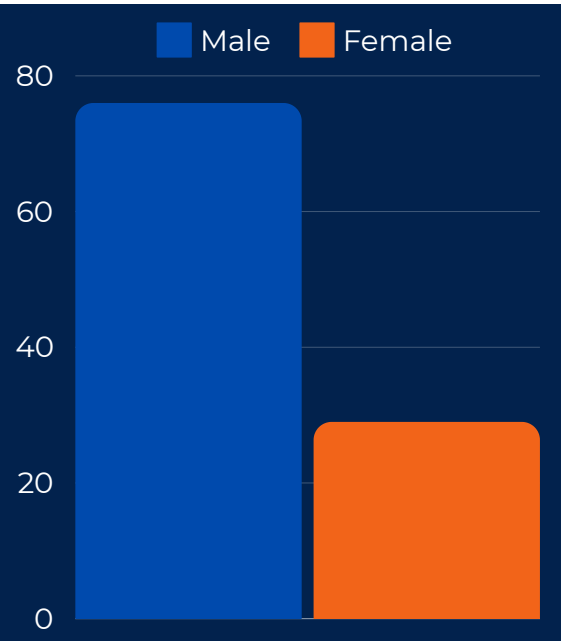
73% Engineering 26%

80% ICT 20%

66% Maths 32%

% of Irish schools offering additional STEM subjects (exc. maths and science) at leaving certificate level

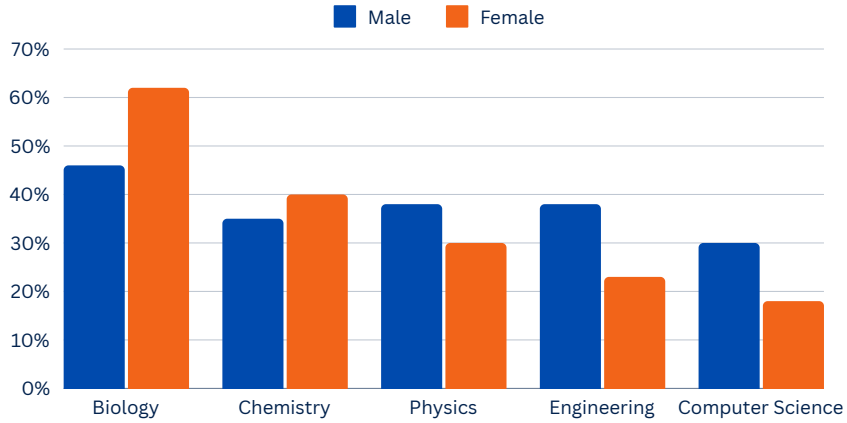
All Girls Schools	**68.3%**
Mixed Gender Schools	**86.8%**
All Boys Schools	**95.8%**



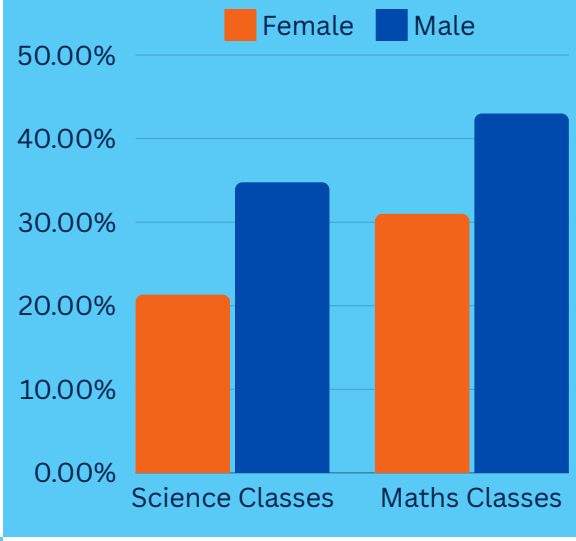
% of Junior Cert students taking additional STEM subjects (exc. maths and science)

Our Data Shows

Student intentions to study STEM at Leaving Cert Level



I am confident in my...



I am familiar with STEM

58%

73%

2x

Boys were twice as likely to report being extremely familiar with Technology than girls

Why We Need STEM Passport

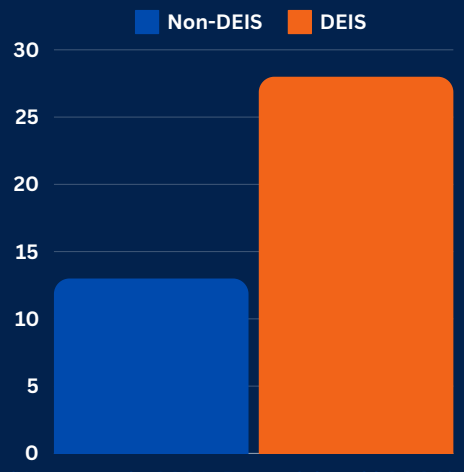
The STEM Passport for Inclusion is dedicated to addressing class-based inequalities for students from lower socio-economic backgrounds, especially those in DEIS schools. National research indicates a significant socio-economic gap, with disadvantaged students often showing lower science values, abilities, and graduation rates. Our findings reinforce these disparities, highlighting notable differences in subject choices, science values, and career interests between DEIS and non-DEIS students. **The STEM Passport has been designed to supplement the gap between students in DEIS schools and non-DEIS schools.**

National Data Shows

In Ireland, fewer than 1 in 10 third-level graduates in 2020/21 were from disadvantaged backgrounds.

Of those graduates:

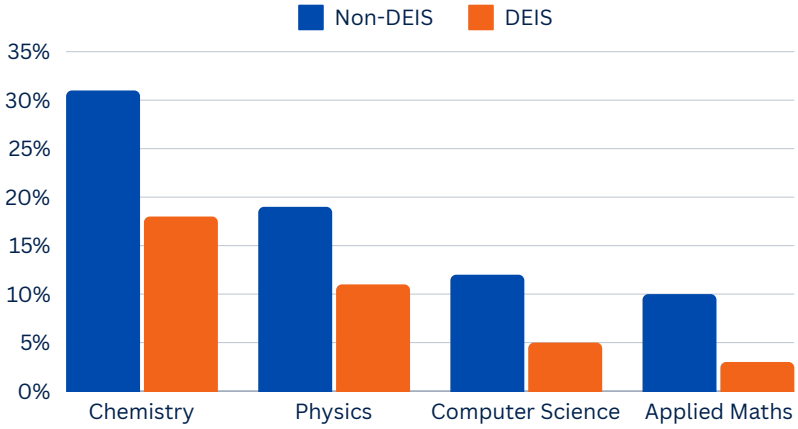
ICT	**11%**
Engineering	**10%**
Maths	**6%**



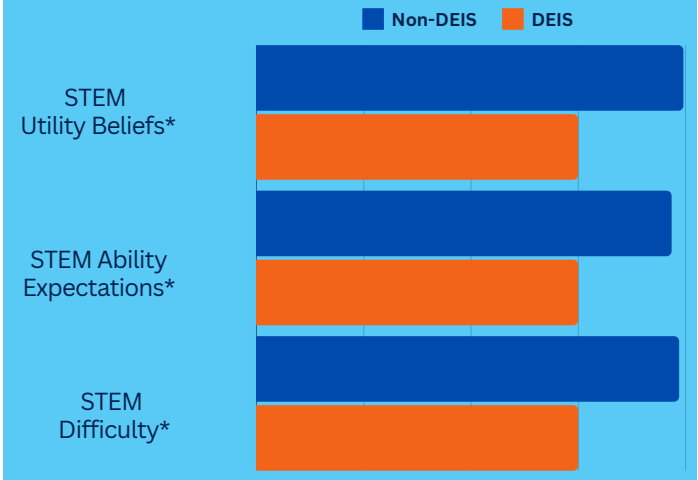
% of students classified as low achievers in science scores

Our Data Shows

Differences in subject choices between DEIS and non-DEIS



Differences in science values between DEIS and non-DEIS



Statistical significance: *p < .01

Differences in science career interest scales between DEIS and non-DEIS

My family is interested in the science courses I take

I would like to have a career in science

Every young person deserves the support and encouragement they need to reach their full educational potential. DEIS is about building on the success stories we have had in tackling educational disadvantage, and addressing shortcomings where we have been less successful. It is about doing what is right for our young people

-Ms Norma Foley TD,
Minister for Education

Why We Need STEM Passport

The STEM Passport for Inclusion research team interviewed 100 girls from across the DEIS school system to understand their experiences of STEM learning. We used national surveys and research, like the I-Wish survey, to understand how young women experience education. This work highlighted some key challenges which face young women in secondary schools. Many reported **not clearly understanding what STEM is, and being afraid of the 'Women in STEM' drive.** In the context of **DEIS there was many students who said their parents were not aware of STEM or what subjects related to STEM.** Many pointed to the **unequal treatment of girls in STEM, with boys being spoken to and treated differently**. Our research shows that there is a need for STEM initiatives which are gender aware, and which supplement cultural and family knowledge of STEM.

Our Data Shows

"I didn't know what STEM meant before this. I've never done anything in engineering, so I can't really have an opinion on it" - STEM Passport Graduate

"My parents, they're not very good at any of the subjects. I'll say STEM to them, and they'll be like - a plant?" - STEM Passport Graduate

"It's just the way they go about talking to them (male students) and teaching them. It's just all different and it just feels a bit like they just do it for you, so you'll stop annoying them" - STEM Passport Graduate

"I think everyone is scared off STEM because it is great that like they're pushing females into it but you're like 'Oh my God'. It's constant women in STEM – how do we get you into STEM and everything?" - STEM Passport Graduate

National Data Shows

According to the I-WISH 2024 Report, students identified several factors which they perceived as barriers to STEM Careers including:

Perceived Difficulties

STEM subjects are often perceived as difficult, and students fear the challenge and possibility of failing, which deters them from committing to these disciplines.

Lack of Access to Resources, Information and support

Students reported not having adequate information about STEM career opportunities or the educational paths needed, particularly in underserved areas. Both from educators and family, a lack of encouragement for girls pursuing STEM has a significant impact, as students feel unsupported in their ambitions.

Stereotypes and Gender Bias

Gender stereotypes and societal expectations often discourage girls from pursuing STEM subjects. This includes misconceptions that STEM is "for boys," leading to reduced self-esteem and interest in these areas among female students.

Our Research Methodology

The STEM Passport for Inclusion conducted 3 studies over the course of 4 years to establish the impact of the programme. Our interest was in understanding the immediate impact of the STEM Passport for Inclusion on STEM perceptions, aspirations, confidence and intention. We also sought to understand the value of the programme in the context of the DEIS school system. The research findings are organised around four themes, these focus on highlighting the impact of the STEM Passport for Inclusion in creating a STEM prepared cohort of students.

1

STEM Passport Reach

We report the impact from data collected on participation rates. Between 2021-2024, we have recorded the number of students who have participated, their county, completion rates and the number of engagements with mentors, industry and policy makers.

2

Reducing the DEIS Gap

In study one, we report results from data collected in 2021-2022. The results is from surveys with 230 DEIS and 191 Non-DEIS senior cycle girls; pre and post participation.

3

Broad Outcomes

Over 4 years we collected data from 2,000 students who participated in the programme; including surveys and follow-up interviews and focus groups. This section shows the broad impact on gender views, STEM aspirations and where our students go from here.

4

Case Studies

Throughout the report we present unique case studies which represent the broad impact of the STEM Passport on schools, mentors, industry and students

> **If we knew what we were doing, it would not be called research, would it?** - Albert Einstein

1. Our Reach

The STEM Passport for Inclusion has significantly impacted STEM education for students from DEIS schools, engaging 117 schools and reaching 5,370 students, with 50% in rural areas. The programme has achieved a 70% completion rate, aligning with national science completion rates. It has registered 1,447 mentors, with 966 of those being trained to deliver a total of 2,524 mentoring hours. Supported by 180+ companies, it has facilitated 418 STEM sessions. As of 2024, 50% of DEIS post primary schools have participated, highlighting its extensive reach and transformative impact in promoting STEM education and careers.

The substantial industry support highlights the importance of collaboration in achieving educational equity. The STEM Passport for Inclusion is a beacon of hope, it exemplifies the power of collective effort in fostering a more inclusive and equitable future in STEM.

5,370 students reached

1,447 mentors registered

324 teachers reached

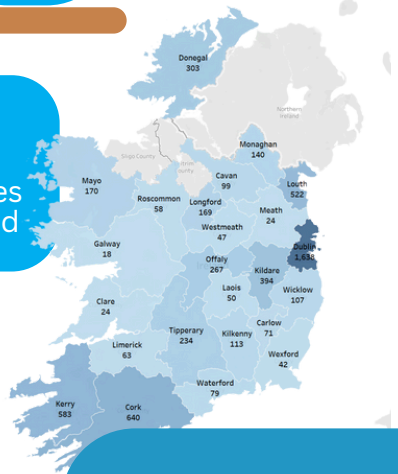
966 mentors trained

117 schools engaged

50% of the year students live in rural areas.

418 STEM sessions delivered

2,524 mentoring hours delivered



23 counties reached

180+ supporting companies

€2,744,403.10 Raised

70% Completion Rate

50% of Deis schools have taken part as of 2024

1. Our Reach

Since 2021, we have reached 5,370 students from across the 4 provinces of Ireland. We have supported students from 117 DEIS schools from 23 counties to graduate with a university accredited STEM qualification, while still in secondary school.

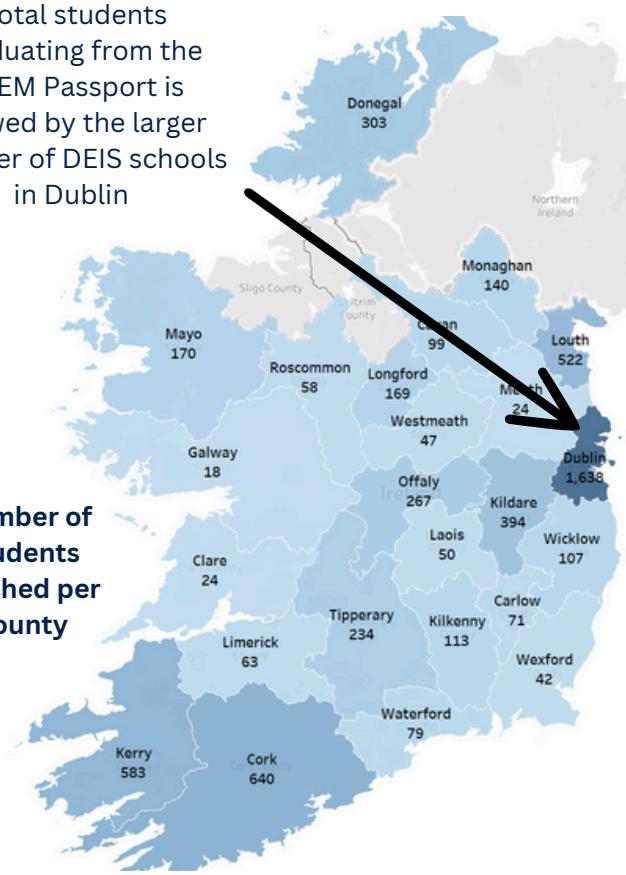
Total students graduating from the STEM Passport is skewed by the larger number of DEIS schools in Dublin

5,370
students reached

50%
of DEIS schools have taken part as 2024

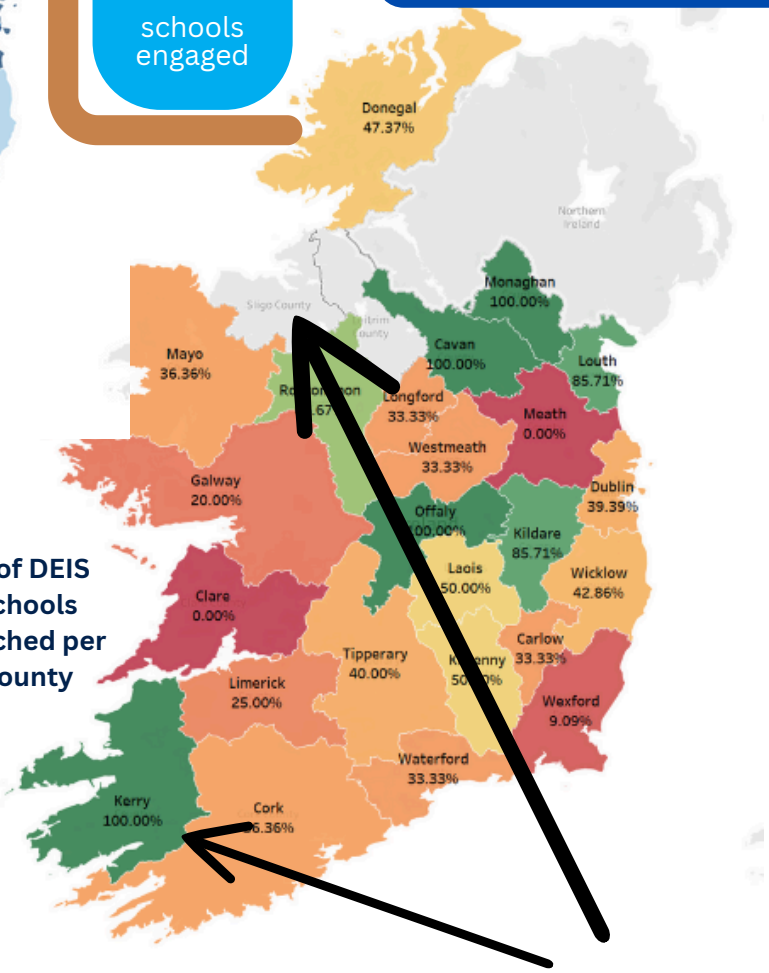
117
schools engaged

Number of students reached per county



70%
graduation rate

% of DEIS schools reached per county



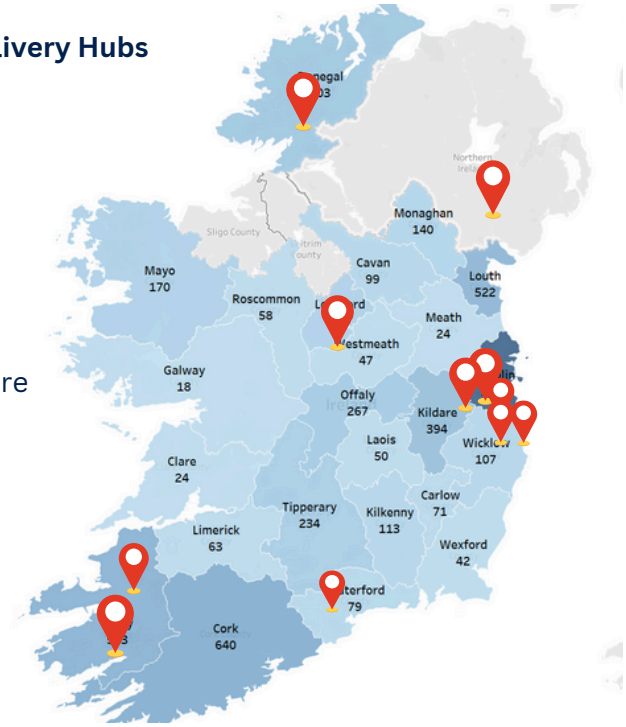
We have reached 100% of the DEIS schools in 4 counties, and in 4 counties we are yet to work with DEIS schools. Nationally, we have worked in 50% of all DEIS schools.

1. Our Reach: Industry Partnership

The STEM Passport for Inclusion is an example of **successful Industry-Education partnership.** Our vision has always been to give our students an experience of education and employment - we do this through mentorship and through delivering the project in Industry hubs. In 2021, we were delivering in 2 Industry Hubs, this has grown substantially and by the end of 2024 we have expanded to 14 Industry hubs. **Microsoft Ireland have been our lead strategic partner from the start, they have developed and delivered the academic content, supported the project financially and have had over 300 staff act as a mentors**. Financial support from Industry and Government has meant we can continue to expand.

180+
supporting companies

Industry Delivery Hubs
Microsoft
AMD
Sun Life
RDI Hub
W5
ATU
Longford
Dun Laoghaire
Library
Eir
PwC
Kellanova
Mastercard



€2,744,403.10 Raised

Microsoft Ireland has been our guiding strategic ally from the very beginning, crafting and delivering the academic content, providing financial support, and enlisting over 300 mentors to work with our students. In 2023, the Microsoft-Maynooth University partnership won Best Women in STEM Initiative Ireland, and the year before we won European Women in STEM Programme 2022.

2. Reducing the DEIS Confidence Gap

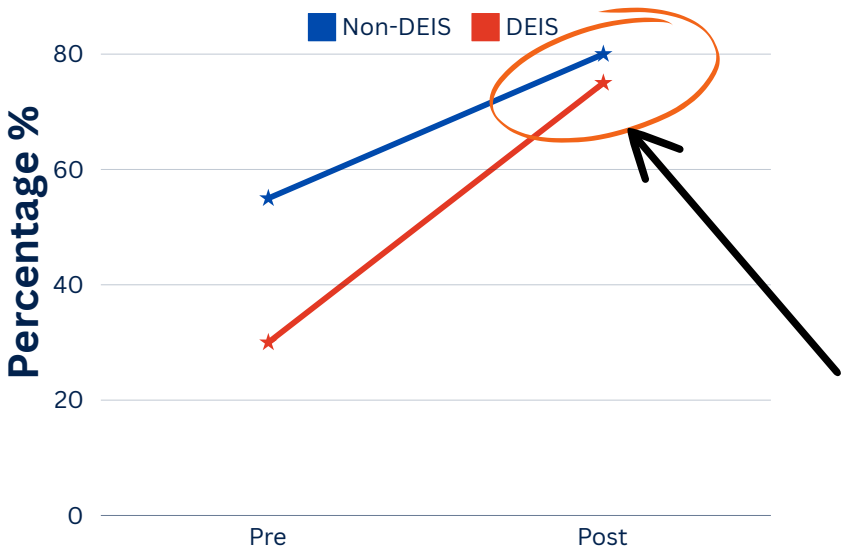
In year one the STEM Passport for Inclusion supported 500 students to participate in the university qualification, and mentoring. To establish the impact of the programme we collected pre and post surveys from 422 students - 231 girls from DEIS schools and 191 girls from Non-DEIS schools. The results showed that **ALL GIRLS demonstrated an increase in intention and confidence to study and work in STEM after completing the programme.** The results also highlight the importance of the STEM Passport in reducing the confidence gap between DEIS and Non-DEIS girls in STEM confidence.

Student intentions and confidence to study STEM

"I had a fantastic time taking part in this initiative. It was one of the best parts of transition year for me and definitely a stand out moment in my time in school. It reignited my love for coding and it opened up my mind to careers in companies like Microsoft in a variety of sectors" - STEM Passport Graduate

"The mentors, they really gave like an insight into what its like, and it kind of made me interested as well and maybe do it as a potential career path" - STEM Passport Graduate

I am confident I could study STEM in the future



Not only did we find that students interest and confidence to pursue STEM increased after participation - we also noted a significant difference between the DEIS and non-DEIS cohorts pre participation. Post surveys revealed that both groups confidence increased significantly - **the DEIS students showed a bigger increase in confidence - after the STEM Passport their confidence was almost equal to their non-DEIS counterparts.**

3. Broad Outcomes

The aim of the STEM Passport for Inclusion was to ensure that all students, irrespective of class or condition, could engage meaningfully in STEM. We see that the STEM Passport graduates showed an increase in their knowledge of and their familiarity with STEM. They also had a **64% increase in knowing a woman in STEM.** The students were more likely to want to work in STEM, study STEM and **most importantly they reported a changed view of STEM after participating in the STEM Passport for Inclusion Program.**

STEM Knowledge and Familiarity

of students reported they knew what STEM was before participating in the STEM Passport for Inclusion.

of students reported they knew what STEM was after participating in the STEM Passport for Inclusion.

Only **28%** of students reported knowing a women who worked in STEM before participation, compared with

92%

after participation

The STEM Passport Lab days and mentoring have changed how I view STEM

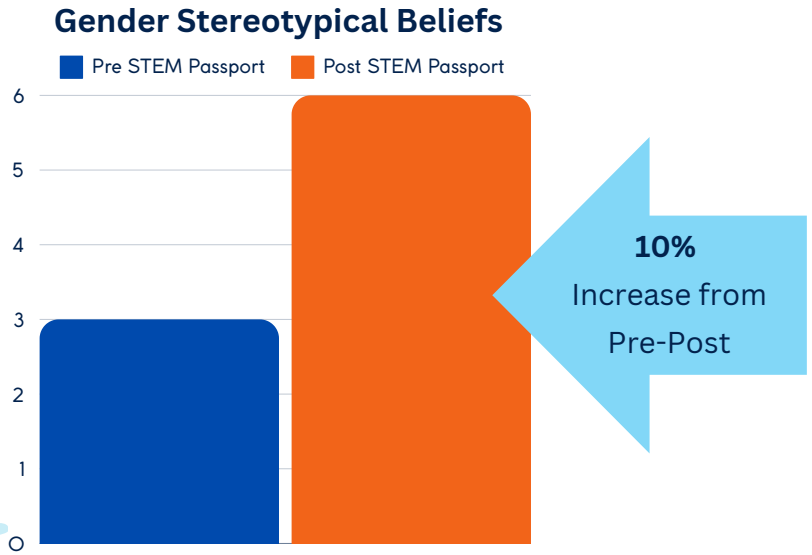
I am now considering a career in STEM because of the STEM Passport for Inclusion

I am now considering applying to study STEM because of the STEM Passport for Inclusion

"Seeing women and people of colour excelling in STEM roles gave me role models who I could relate to and aspire to emulate. It shifted my mindset from being hesitant about entering these fields to feeling empowered to pursue them. I no longer saw STEM as a space where I didn't belong, but as one where I could thrive and contribute meaningfully." - STEM Passport Graduate

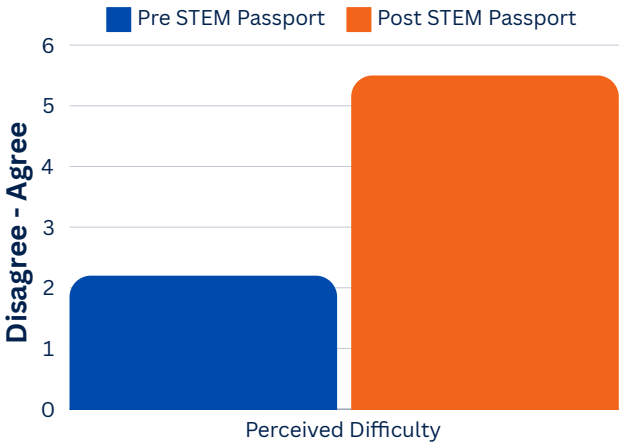
3. Broad Outcomes

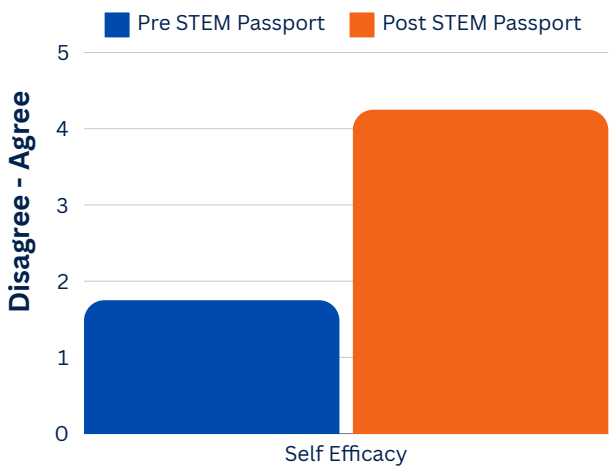
Analysis of students' gendered STEM stereotypes, including questions like “STEM is more important for boys than girls” and “Boys do better in STEM than girls,” showed a significant shift in attitudes over time. This change highlights that students are more open to the idea that both boys and girls can excel in STEM subjects, reflecting the positive impact of the programme in promoting gender equality in STEM.



What excites me most about being in this field is not only the scientific discoveries but also the chance to advocate for more women and underrepresented groups in STEM. I want women like me to feel that they belong in these fields and can excel. The STEM Passport for Inclusion played a pivotal role in shaping this mission. It instilled in me a desire not just to thrive in biomedical science but to actively work toward making STEM more inclusive for future generations. - STEM Passport Graduate

Students' perceptions of STEM difficulty showed a significant change over time. The increase in scores suggests that after participating in the programme, students felt more confident and found STEM subjects easier to understand, highlighting the programme’s success in reducing perceived barriers to STEM learning.

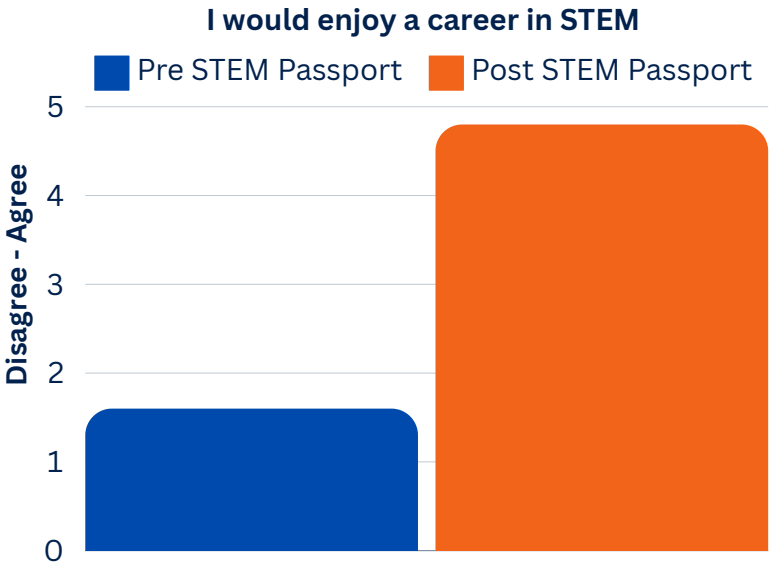




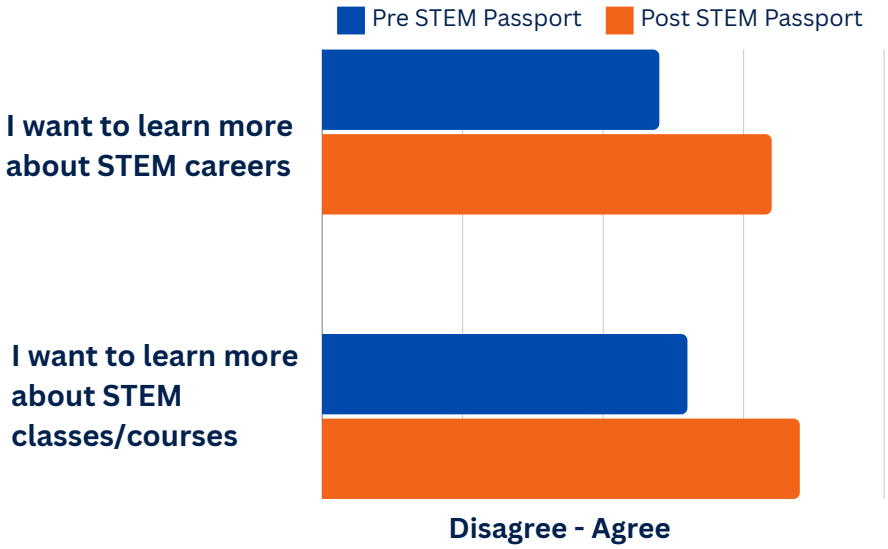
Students' self-efficacy in STEM showed a significant improvement over time. This increase indicates that students felt more capable and confident in their ability to succeed in STEM subjects after participating in the programme. The results highlight the programme's effectiveness in enhancing students' self-belief and motivation to pursue STEM education.

3. Broad Outcomes

The STEM Passport for Inclusion aims to ensure all students are STEM prepared, and that they can see the value of a STEM course or career. Alongside this, we aimed to provide them with a positive experience of STEM through an interactive module conducted in an industry setting. When surveyed, STEM Passport graduates showed increases in their positive perception of learning STEM & in their desire to learn more about STEM courses and careers



"One of my favourite memories was presenting myself and my work in front of the whole group, although at first I was a bit nervous however seeing my peers doing the same made me brave somewhat. I'm still proud of myself for graduation! My whole family came over to Maynooth University just to see me graduate while I was still in school. For my parents it was a proud moment and I will always remember how they got emotional seeing my achievement. I would like to thank the team and STEMP as a whole for making it a great opportunity for me and I hope the same goes for women like me." - STEM Passport Graduate



4. Case Study: Borrisokane Community College

Each year the reach of the STEM Passport grows, new schools come on board and old ones remain. Our vision is to work in every DEIS school in Ireland in the coming years - offering a Transition Year programme which is fully accredited and available to ALL students. The impact across the schools has been a growth in awareness of STEM, and higher STEM aspirations. One of our core schools described the impact on girls taking up the Leaving Cert computer science course after participating in the STEM Passport, and they are now leading a coding club in the school.

117 schools engaged

324 teachers reached

418 STEM sessions delivered

"The STEM Passport for Inclusion has had a huge impact in our school in such a short amount of time. We have had one group of girls pass through the course and the entire experience was so very positive." - Teacher, Borrisokane Community College

"The interest in taking part in STEM has impacted our school through the introduction of code club, ran by the STEM girls. The girls have also spoken to younger students to encourage them to choose subjects in STEM."

"The number of 5th Year girls studying Computer Science for Leaving Cert has gone from none(!) in 6th Year to 8 in 5th Year. On a personal level, I had such a wonderful experience working with the girls on STEM last year and have made such strong bonds with the girls. "

"We have had one group of girls pass through the course and the entire experience was so very positive it has given them a 'I can do!' attitude."

Computer Science Leaving Cert

In 2021, girls made up only 27% of all the students who took the Leaving Cert Computer Science exam in Ireland; it is only offered in a limited number of girls schools. This percentage reflects the ongoing need to increase female participation in STEM subjects. The STEM Passport for Inclusion is motivating female students to take up this course where it is available in schools - another exciting impact of the work we do!

4. Case Study: Mentoring

1447 mentors registered | **966** mentors trained | **2,524** mentoring hours delivered

Each year our list of mentors and the companies they come from grows. In year one, we had 80 mentors from 4 companies, in year 2 this rose to 120 mentors across 11 companies. In 2024 we have worked with 1,447 registered mentors, with 966 mentors trained from 180+ Industry partners. Mentoring for Equality transforms the students lives AND the mentors - opening their eyes to education inequality, empowering them to be allies to girls from DEIS schools. In 2021 and 2022, we used female mentors only; in 2023 onwards we have expanded to include males - this is in recognition that men need to be supporting gender equality programmes - if we are ever going to change the STEM eco-system.

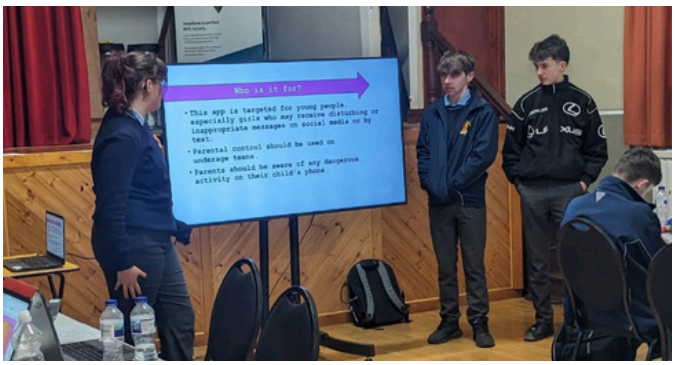
	What impact has participating in the STEM Passport had on you?	What impact has the STEM Passport had on your perceptions of equality and education?	What would you say to a policy maker about the STEM Passport for inclusion?
 **Paula Constabel** Sales Specialist Microsoft	It brought **awareness about the nature of women in STEM to me and that they are underrepresented**. I am spreading the word in my private network	**I was surprised that equality is not equality for all.** I love the programme as the schools are provided with transport options to even get out of their proximity in order to visit companies.	I think there is not enough budget for schools/education. **Education and kids are the wealthiest resource or could be the wealthiest resource a country can have** and we need to nurture those to cover the jobs in STEM.
 **Jen Rigby-Jones** HR Advisor DocuSign	It put reality perspective on my work. It informs my own knowledge of education systems and teenage anxiety. **I feel that I need to share their stories that I am part of their voice to improve education, jobs and health for women in Ireland.**	It made me see another side to education. Coming from a privileged background, **I had no real idea of the struggles others face in the Irish education system and the additional barriers they face.** It made me take time to consider the other factors within their lives which might affect their outlook and career aspirations.	The programme is an incredible look into an area of education and potential careers for these students. **The programme should be available to all under privileged students as a matter of educational rights,** so that they can make an informed decision about their further education and potential career, which ultimately could bring prosper to not only their life, but society in general.
 **Samuela Finn** Programme Manager Microsoft	**I discovered new unconscious biases of my own and was struck by how resourceful, clever, and deep-thinking young people can be. I also realised that bias is often intergenerational** - I heard some of the girls express beliefs similar to what my own mother used to tell me when I was growing up.	I have learnt that **schools offer a different curriculum depending on the societal class** of students they are serving, which sets in motion a number of other inequalities students - and parents - are not in control of. Students don't know what they don't know, and cannot ask for better.	I would say it has **opened opportunities for students to view their education in a different light,** thinking outside the box they were put in, and it has the **potential to empower a whole generation of young people to do more with their lives,** and contribute more to society and the common wealth of the country.

4. Case Study: Longford County Council

The STEM Passport for Inclusion prides itself in reaching communities that are the most underserved. In 2023, we were approached by Longford County Council to work with students in the region. Longford is one of the most underserved communities in terms of education opportunities and is facing significant challenges with the transition to a low-carbon future, particularly with the decline of peat-fuelled power generation. This has created an urgent need to up-skill the local workforce for new industries

Inclusive Education

70 students from 4 mixed school in Longford completed the programme. This was our **fist delivery to boys** and it proved extremely impactful: students, teacher and mentors describing the impact on student beliefs and aspirations.



Local Access Benefits

Providing students from disadvantaged areas with local access in our rural communities offers **benefits by expanding education opportunities, fostering skill development, academic success, and greater community support**.

Sustainability Efforts

By utilising Longford County Council's Hub Broadband Connection point, the county was also able to **reduce costs and promote sustainability by minimising environmental impact.**

"Around 70 students in Longford completed the programme, earning a Level 6 STEM University qualification, building relationships with STEM industry mentors, and gaining 50 Leaving Cert points towards a STEM course. The positive feedback from teachers and students shows that this programme has truly shifted perceptions of STEM, with many more students now considering STEM careers" - Christine Collins, Broadband Digital Officer, Longford County Council

4. Case Study: Youthreach

One of the unique features of the STEM Passport for Inclusion has been our ability to shift focus, and respond to requests from diverse communities. In 2023 we were asked if we could adapt the programme for students in Youthreach - and of course we said yes! We re-designed the delivery and made it 5 half days; and we adjusted the mentoring focus. The results have been inspiring. Youthreach students are outside of the mainstream classroom, and historically have poorer outcomes in employment than students in who remain in mainstream secondary school. We delivered the STEM Passport to 19 Youthreach students in 2023 - the students have asked for more, and are now aspiring for different things as a direct result of the programme.

"The STEM Passport for Inclusion provided my group, who had mixed ability and interest in IT and computers, with a new view of what computers can be used for outside of our centre and how they might use them in the future, be it in further education or in whatever line of employment they decide to follow. **The course having such a wide range of topics for learners to explore has helped boost their curiosity and willingness to learn now that we are back in regular classes**, with some of them asking if we could cover some of the topics that they had covered during the course. "
Jamie McCarthy - IT Skills Teacher Youthreach Crumlin

"One of my students has told me that the course helped them settle their decision to **study animation after Youthreach, rather than pursuing another form of art.** "

"They enjoyed being able to travel out to Maynooth University and to the Microsoft Offices here in Dublin. One member of the group said that **they now want to go to Maynooth after their time in Youthreach, something they had not thought possible previously.**

Another member of the group told me that **their time in the programme helped cement their plan to study Computer Science** after their time in Youthreach."

"...one of the main takeaways of the group was that they were able to develop more of an understanding of how computers work and how to interact with them, which has definitely helped them with class work, even empowering them to help their classmates with using their computers."

What is Youthreach?

Youthreach is an education and training programme in Ireland aimed at early school leavers aged 15-20. Youthreach students face different challenges and opportunities compared to their peers in mainstream education. While they might not achieve the same academic qualifications, Youthreach provides valuable vocational training and personal development support that can lead to successful careers and improved well-being.

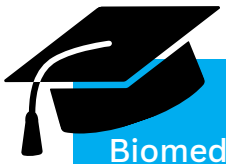
Where Our Graduates have Gone!

Ellie
Quality Engineer, Medical Device Company

"The STEM Passport **opened my eyes to engineering** and I ended up studying biomedical engineering in the University of Limerick."

Ava
Science Student, Maynooth University

"This was not just a course; it was a journey of self-discovery, of finding my passion and purpose. It set me on a path where I could dream big and aim high, knowing that **the world of STEM welcomed me with open arms."**



Abby
Biomedical Engineering Student

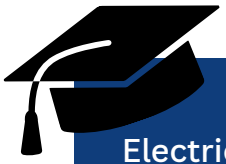
"The STEM Passport programme **made me fall in love with technology and computers.** We got to understand and learn a lot of new things that would not be brought into schools usually."

Kaitlyn
Adult Nursing Student, Derry

"Before, I doubted my abilities as a woman in a predominantly male school and thought that was the way life is. However, **the female empowerment shown during STEM passport completely changed my mindset."**

Samaya
Biomedical Science Student, TCD

"The programme gave me the **confidence and motivation to claim my place in STEM,** a space that I've always aspired to be part of but sometimes felt distant from."



Claire
Electrical Engineering Student

"The STEM Passport allowed me to access a different side of STEM which allowed me to see the amount of choice there is within STEM. **This helped in my choice of course."**

Emer
Early Childhood Education, MTU

"The STEM Passport for inclusion opened extra opportunities for me. I was considering doing a Science course in university and STEM Passport **made that option more accessible with the extra Leaving Cert points."**

Jessica
Food Science, MTU Kerry

"The STEM Passport have a me a **wider range of careers and courses to do and think about."**

Maeve
6th year student, Co. Clare

"I enjoyed the introduction to coding and different aspects of technology that you wouldn't be introduced to in school. **I'm planning to do Engineering in UCC next year thanks to this programme."**

Our Challenges

The STEM Passport for Inclusion has been successful since its inception, reaching thousands of students and continuing to grow and expand. However, many lessons have been learned along the way. Several challenges emerged during the programme's implementation that impacted outreach, participant retention, and completion rates.

1

Too many applied & not enough funding

Firstly, demand for the programme exceeded the available funding, with more schools applying than could be accommodated. This limitation resulted in a selection process that left several interested schools without access, reducing the programme's potential to reach a broader population. In order to address the increased demand, recruitment focused on DEIS secondary schools.

2

Schools lack of access to resources

Additionally, many participating schools lacked essential resources and infrastructure needed to fully engage in the programme. Limited access to technology, lab equipment, and reliable internet created barriers that hindered schools' ability to deliver the programme content effectively. This challenge disproportionately affected schools in underserved areas, where these resource gaps were most pronounced.

3

Schools requiring more support

Furthermore, a significant number of schools required extensive support to complete programme assignments. Teachers and administrators often faced difficulties integrating programme tasks within their existing workloads, leading to delays and, in some cases, incomplete assignments. The additional support needs placed pressure on both the schools and programme staff, stretching available resources thin and impacting the quality of programme delivery.

4

Schools travel constraints

For some students attending schools located in rural or isolated areas, difficulties arose regarding the schools ability to travel for sessions. Students in these areas often face logistical challenges due to limited access to transportation, which affected their ability to attend in person and required facilitators to travel to individual schools with equipment.

Together, these challenges contributed to the dropout rate among schools and students. Recognising and addressing these limitations will be essential for the programme's future success, particularly in securing additional funding, developing targeted support mechanisms, and addressing resource disparities across schools.

Recommendations

1 Fund a 5 year pilot STEM Passport for Inclusion to be ran in all DEIS schools:

To promote equitable access to STEM education and empower students from diverse backgrounds, it is recommended that the STEM Passport for Inclusion be established as a fully funded Transition Year (TY) programme specifically for DEIS schools. This initiative will ensure that all students, regardless of socio-economic status, have the opportunity to develop critical skills in science, technology, engineering, and mathematics - thereby fostering a more inclusive and innovative future workforce.

2 Ensure DEIS schools have access to technology:

DEIS schools require additional resources and infrastructure to participate effectively in STEM projects. Developing a standardised support package, including loaned technology, mobile lab kits, and programme-specific materials, would help address these disparities. We recommend that to ensure students in DEIS schools are well-prepared for the future, it is crucial to provide them with a complete suite of computers and coding resources. Access to modern tools will empower these students to excel in STEM fields. This investment aligns with Ireland's Digital Strategy for Schools to 2027, which emphasises embedding digital technologies in teaching and learning. Equipping DEIS schools with the necessary technology is essential for creating equal opportunities for all students to thrive in a rapidly evolving world of work.

3 Ensure DEIS students have access to a state run STEM work experience programme:

To ensure students in DEIS schools gain valuable real-world skills, it is essential to establish a formalised Transition Year work experience programme. This programme should be fully funded and developed in partnership with industry. **Currently, students in the STEM Passport for Inclusion programme are qualifying in STEM fields but lack work experience opportunities.** By providing structured, meaningful work experiences, students can explore various career paths, develop professional skills, and build networks. This initiative will bridge the gap between education and employment, fostering equal opportunities and preparing students for future success. Investing in such programmes is crucial for empowering DEIS students and supporting their transition into the workforce.

Recommendations

4 Fund comprehensive, longitudinal research programme which establishes the effectiveness of STEM inititiaves:

To ensure the continued success and improvement of the STEM Passport for Inclusion, it is recommended that the government fund a comprehensive research programme. This programme should aim to establish the long-term impact of the initiative on students' educational and career outcomes. By systematically evaluating the effectiveness of the STEM Passport for Inclusion, we can identify areas for enhancement and ensure that the programme continues to meet its goals. This investment aligns with Ireland's commitment to fostering STEM education and addressing gender inequalities, ultimately supporting the development of a skilled and diverse workforce.

5 Reward Initiatives that are collaborative and large scale:

To ensure the sustainability and success of collaborative programmes like the STEM Passport for Inclusion, it is recommended that the government implement a system to reward initiatives that work collaboratively with Industry to solve Sustainable Development Goals. These programmes, which work across industry and education, should receive stable, long-term funding rather than having to chase funding every two years. This approach aligns with national policies that emphasize the importance of strategic partnerships and consistent support for STEM education. By providing reliable funding, we can ensure these programmes continue to foster innovation, bridge educational gaps, and prepare students for future careers in STEM fields.

6 Offer all STEM subjects to ALL students:

To ensure equitable access to quality education, it is recommended that all schools in Ireland offer STEM subjects equally. This aligns with Ireland's STEM Education Policy Statement 2017-2026, which emphasises the importance of providing high-quality STEM education to all students. By ensuring that every school offers a comprehensive range of STEM subjects, we can foster a more inclusive and diverse learning environment. This approach will help prepare students for future careers in STEM fields, addressing skills shortages and supporting Ireland's goal of becoming a leader in STEM education and innovation.

Conclusion

The Impact of the STEM Passport for Inclusion
The STEM Passport for Inclusion has proven to be a valuable in terms of addressing systemic inequalities in STEM education, particularly among socioeconomically disadvantaged girls in DEIS schools. Since its development, our findings have shown that our programme has aided in increasing students' STEM knowledge, career intentions, and self-efficacy – all while breaking down barriers in a traditionally male-dominated field. Supported by industry partners and educational institutions, the programme has successfully connected over 5,000 students with accredited training and real-world industry experiences.

A crucial component of the STEM Passport for Inclusion has been its mentorship programme, which has offered over 2,500 hours of mentoring to students by professionals from various STEM fields. This has inspired students who previously lacked role models in STEM. This programme's emphasis on mentoring for equality has also encouraged mentors to examine and overcome unconscious biases, fostering a supportive environment for students.

Next Steps
As the programme continues to expand, the commitment to providing equitable access to STEM education has become more robust. With anticipated growth for the programme – driven by increased funding and partnerships, the programme aims to address the challenges by broadening its reach to all DEIS schools nationwide, ensuring that students from disadvantaged backgrounds have consistent access to high-quality STEM education.

Looking forward, the STEM Passport for Inclusion stands as a model for programmes globally, demonstrating that a collaborative and inclusive approach can successfully inspire a new generation of women ready to thrive in STEM fields. The programme's success illustrates that, with targeted support and opportunities, systemic inequities can be dismantled, creating a STEM landscape that welcomes and empowers all students.

STEMP.INC

PASSPORT FOR INCLUSION

Maynooth University
National University of Ireland Maynooth

Microsoft

Taighde Éireann
Research Ireland

An Roinn Oideachais
Department of Education

MTU
Ollscoil Teicneolaíochta na Mumhan
Munster Technological University

Ollscoil Teicneolaíochta an Atlantaigh
Atlantic Technological University