Strengthening belonging in STEM higher education

White paper
Office for Students

November 2026

Women into Science and Engineering

TOGETHER WITH: IET

About this paper

Women into Science and Engineering (WISE) brought together leaders and experts from academia, industry and government to explore **how we can work together to strengthen belonging in STEM for 16-18-year-olds as they navigate the transition to higher education**.

The event was established following a research project in collaboration with Dr Kartik Vira and Dr Nagisa Tadjfar. Their paper, **Friends in Higher Places: Social Fit and University Choice** found that concerns about social belonging, rather than academic ability alone, can play an important role in shaping university application decisions. Using this research, WISE focused on the experiences of girls and women in STEM to better understand what academia, industry and government need to do to support their progression into STEM higher education.

Increasing the participation of women in STEM is not only an equality issue, but a skills and economic growth issue. The UK's Industrial Strategy relies on a strong pipeline of talent into sectors such as engineering, advanced manufacturing, energy and digital technologies. Improving belonging and progression into STEM higher education will therefore help address both gender disparities and critical workforce shortages.

This paper explores how belonging influences young women's progression into STEM higher education. It draws on research and stakeholder discussions to examine the gap between participation in STEM at further education and progression into STEM higher education, and sets out recommendations to strengthen belonging and support a more diverse STEM talent pipeline.

This policy white paper was written by Women into Science and Engineering (WISE) and informed by research and stakeholder engagement from;

- EngineeringUK
- University College London (UCL)
- King’s College London (KCL)

What is the significance of the gender gap in STEM?

STEM skills shortages across different sectors and education levels are estimated to cost the UK economy £1.5 billion per year. The UK faces a shortfall of more than 173,000 skilled STEM workers[1] to meet the current and future demand.[2] Yet, women only make up 27.7% of the UK STEM workforce, with representation dropping even further in fields such as engineering and technology. [3]

Persistent stereotypes, unequal opportunities and a lack of representation continue to shape who sees STEM as a viable and accessible career. The STEM sector benefits from a wide range of experiences and perspectives to help identify unmet needs, challenge assumptions and develop real-world solutions that work for more people.

Inclusion is not only a talent and workforce issue, but also a factor in creating safer, more effective and more equitable outcomes. Closing the gender gap in STEM is critical to unlocking untapped talent, meeting future skills demand and creating better outcomes for society.

Participation gaps in STEM education

The UK's STEM skills shortage cannot be addressed without tackling the loss of women from the STEM pipeline.

Although girls make up 42.9% of STEM A level students,[4] only 26.7% of STEM undergraduates are women.[5] This sharp drop reveals a crucial transition point where thousands of capable young women are leaving STEM pathways before entering higher education and the future workforce.

[1] A level results 2026 - Building a stronger STEM pipeline for girls remains critical for the UK's future workforce
[2] UK STEM skills pipeline - POST
[3] Workforce Data – March 2026
[4] Post-16 STEM results 2026: A levels, Advanced Highers, T Levels and VTQs
[5] Higher Education Statistics – 2024/2025

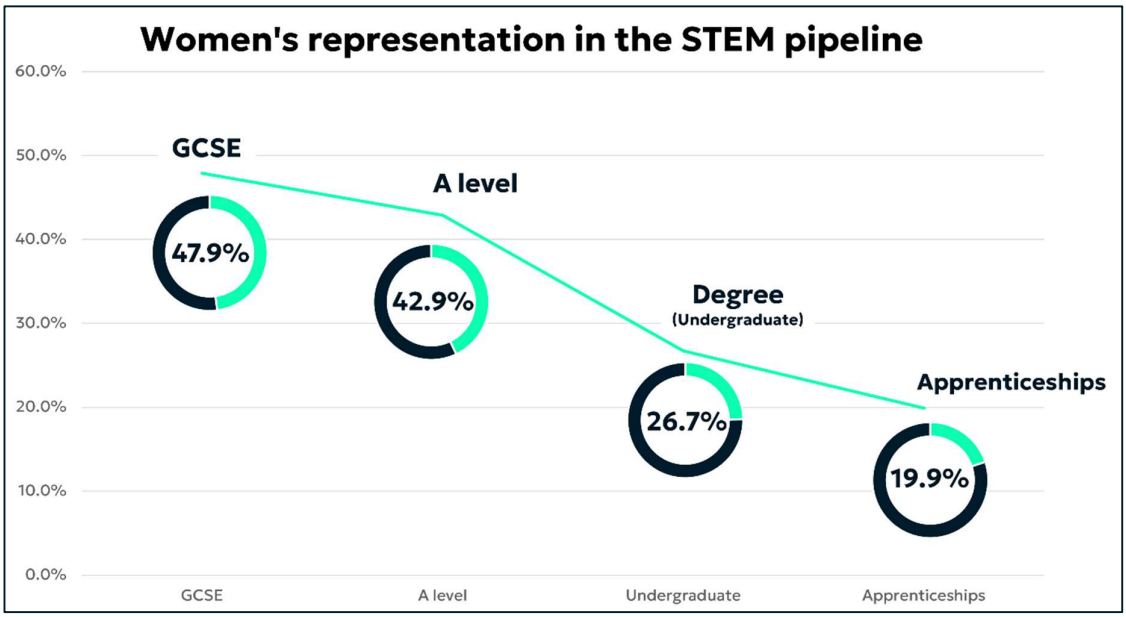


Figure 1: https://wise.theiet.org/resources-and-impact/research-and-statistics/

The sharp decline between A level and undergraduate study reflects the broader participation discrepancy across the STEM pipeline. Whilst the representation of girls at A level looks relatively strong, there are persistent gaps in key 'feeder' subjects such as Maths and Physics. These subjects often act as gateways to STEM degree courses. Participation gaps at this stage can limit progression into higher education and STEM careers.

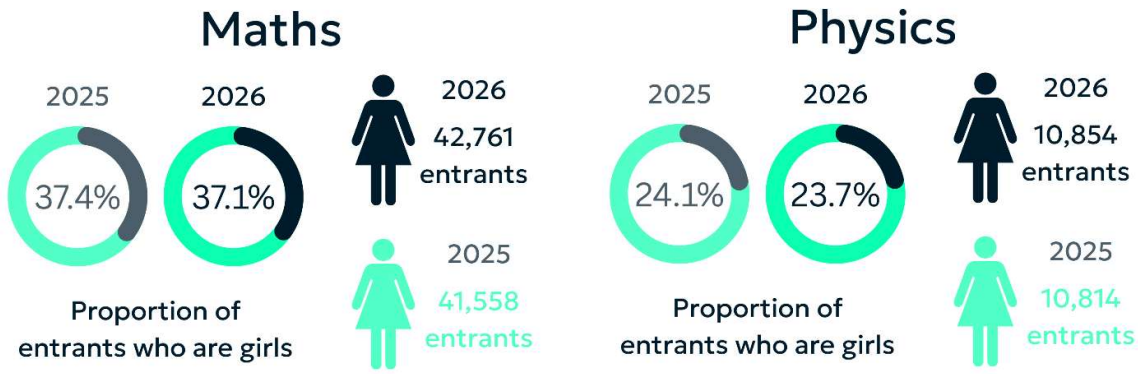


Figure 2: https://wise.theiet.org/resources-and-impact/research-and-statistics/a-level-results-2026/

Other key STEM subjects such as Computing and Further Maths, whilst growing in the number of entries by girls, still attract significantly fewer entries from girls in comparison to other specialist subjects such as Economics, Law and Political Studies.

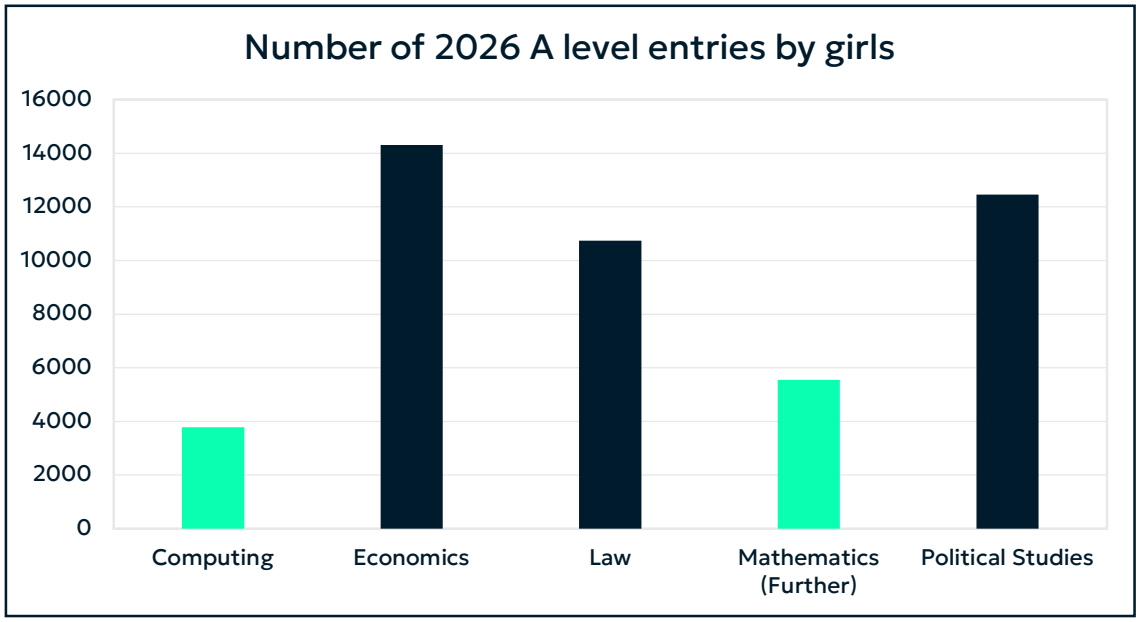


Figure 3: https://wise.theiet.org/resources-and-impact/research-and-statistics/a-level-results-2026/

These patterns continue into higher education, where women remain substantially underrepresented in Engineering and Technology, and Computing degree programmes.

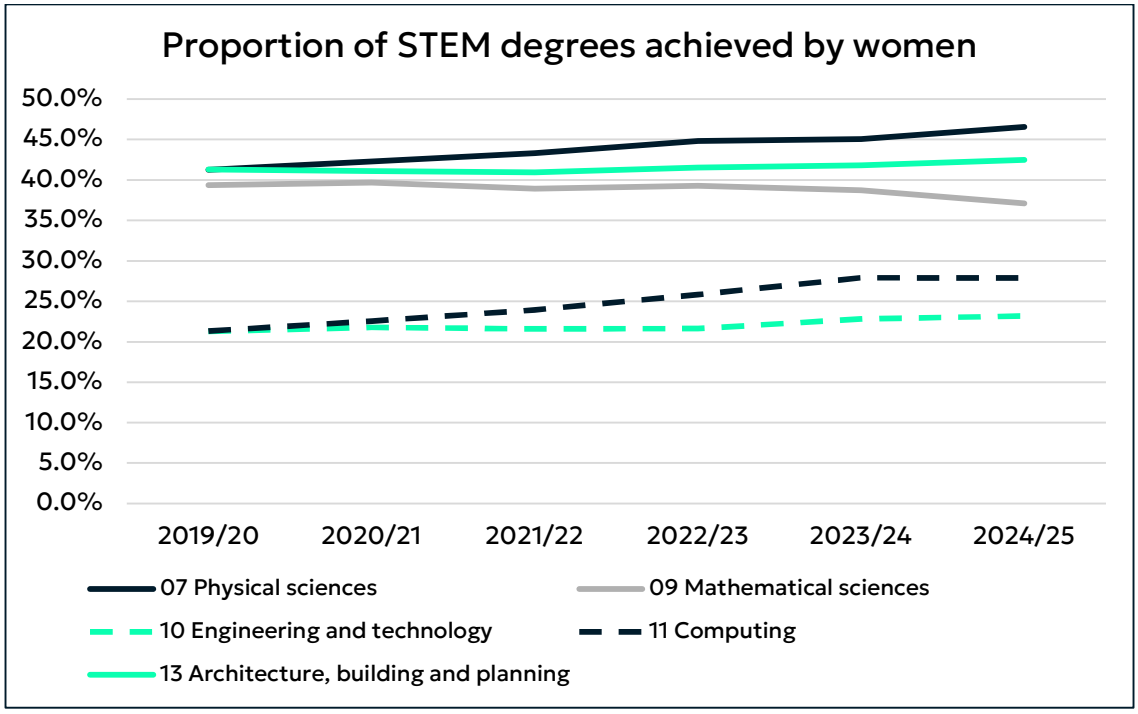


Figure 4: https://wise.theiet.org/resources-and-impact/research-and-statistics/higher-education-statistics-20242025/

The role of belonging

The gap between participation in STEM subjects at A level and progression into STEM higher education represents a significant loss of talent at a time when government, employers and Skills England are working to address skills shortages across the STEM workforce. Understanding and addressing the factors contributing to this progression gap should be a priority for policymakers.

As highlighted in the research underpinning this paper, academic attainment alone does not determine progression into higher education. Perceptions of belonging, social fit and representation influence whether young people choose to pursue STEM pathways. To address this, academic institutions, industry and government must work together to create environments where young women feel supported, represented and able to see a future for themselves in STEM.

Through consultation with academic institutions, we have identified several recommendations for strengthening belonging and improving progression into STEM higher education.

Recommendations

Embed inclusive teaching practices across STEM education

The Office for Students should require higher education providers to better demonstrate, through regulation and accountability frameworks, how inclusive teaching, assessment and curriculum design are being embedded across STEM courses and how these approaches are improving outcomes for underrepresented students.

This aligns with findings from the Gender Pathways Collective's *40 by 40 Blueprint for Action*, which highlights how girls' participation in STEM pathways can be influenced by experiences throughout education. Focusing on pathways up to age 18, the Blueprint and supporting evidence provide important context on the factors influencing subject choices and progression before the transition to higher education. Together, this evidence suggests that creating a sense of belonging is important throughout the education journey, including the transition into higher education.

Research consistently shows that students are more likely to engage, persist and succeed when they feel recognised, valued and able to see themselves reflected in their learning environment. For women and other underrepresented groups in STEM, inclusive teaching practices can help challenge stereotypes, improve confidence and strengthen a sense of belonging during the transition to higher education.

Inclusive teaching practices include:

- Evidence-based training to help educators recognise and mitigate bias in teaching and learning environments.
- Equipping staff with the confidence and skills to challenge stereotypes and address exclusionary behaviours.
- The use of inclusive and purposeful language that fosters participation and belonging.
- Supporting educators to identify and nurture aptitude and potential in all students, rather than relying on traditional assumptions about who is most likely to succeed in STEM.
- Regular review of teaching materials, examples and case studies to ensure they reflect diverse perspectives, contributors and career pathways.

WISE has been a contributor to the Gender Pathways collective, which recently launched its *40 by 40 Blueprint for Action*. The Blueprint recognises that girls' participation in engineering and technology is shaped not only by subject choice and attainment, but also by whether they feel these pathways are for people like them. Inclusive pedagogical approaches, visible role models and learning environments that value diverse perspectives can help ensure that women not only enter STEM pathways, but thrive within them.

Inclusive student attraction, create belonging before enrolment

The Office for Students should require higher education providers to demonstrate how recruitment, outreach and communication activities support participation from underrepresented groups, and evaluate the impact of these activities on application, offer and enrolment outcomes.

Efforts to widen participation in higher education often focus on admissions processes and entry requirements. While these are important mechanisms for improving access, they do not address the barriers that influence application decisions. Research found that students from underrepresented groups, such as women in STEM, are less concerned about their academic ability than whether they will belong within an institution and its culture.[6]

The way universities present themselves to prospective students matters. Whether that's through their website, social media, open days and other advertisements. Too often, university recruitment materials emphasise academic prestige and entry requirements while giving less attention to belonging, student experience and the diverse routes through which students can succeed.

Academic institutions should review how courses and opportunities are communicated to prospective students. This includes using inclusive language, showcasing diverse role models and highlighting the breadth of opportunities available through STEM education.

OfS should recognise inclusive communications as a key intervention to help prospective students understand not only what they can study, but how they will be supported, represented and valued throughout their university career.

To support universities in attracting a diverse range of STEM students, WISE is developing an inclusive communication guide to provide practical advice on inclusive language, imagery and good communication practices. This will help universities create recruitment materials that resonate with students from all backgrounds and encourage greater participation in STEM. The guide complements wider sector activity, including work by the Gender Pathways Collective curriculum group, which is developing guidance for publishers of educational materials to help ensure learning resources are more gender-inclusive and representative of diverse experiences.

[6] belonging-perception-and-pathways-into-stem-education-1.pdf

Implementing policies and ensuring that harassment and bullying are dealt with and taken seriously

The Office for Students should require providers to demonstrate how they are implementing the expectations of Condition E6 in practice and evaluate the effectiveness of their approach. This should include evidence on student safety, belonging and reporting confidence, including outcomes for women and other underrepresented groups studying STEM subjects.

The Office for Students already has robust regulatory requirements through Condition E6, requiring universities and colleges to maintain clear policies, reporting procedures and accessible information relating to harassment and sexual misconduct.

However, the existence of policies alone does not guarantee that students feel safe, supported or confident in reporting incidents. Through our roundtable event with a variety of academic institutions, it was clear that there are gaps in the application of the requirements OfS have set out, versus how this is implemented in reality.

While institutions are required to implement measures to prevent and address harassment and sexual misconduct, implementation remains institution-specific and there is limited, publicly available evidence on the consistency of approaches across the sector or their effectiveness in improving student experiences.

As we continue to focus our efforts on encouraging more girls to study STEM subjects, it is paramount that they are kept safe and their wellbeing is prioritised in academic environments.

We recommend that OfS move beyond assessing whether institutions have policies in place and instead focus on measuring impact. Monitoring this could include:

- Awareness of how to report concerns.
- Whether students know where to go for support.
- Whether students feel comfortable reporting concerns.
- Whether students believe concerns will be taken seriously.
- Student experiences of reporting concerns.
- Student perceptions of safety and belonging.
- Differences in experience between different groups of students, including women in STEM.

This would help identify effective practice, improve accountability and ensure that regulatory requirements are translating into meaningful improvements in student wellbeing and belonging.

Creating better relationships between schools/colleges and higher education

The Office for Students should support structured partnerships between schools, colleges and universities to provide mentoring, peer networks, alumni engagement and opportunities for young women to engage with current STEM students.

Research shows that young people, girls in particular, are influenced by their peers and relatable role models.

In a randomised trial, students were shown videos of current undergraduates discussing their experiences at university and the application process. Women in STEM were particularly affected by what was discussed in these videos, being more optimistic immediately after being shown the video and maintaining optimism several months later.

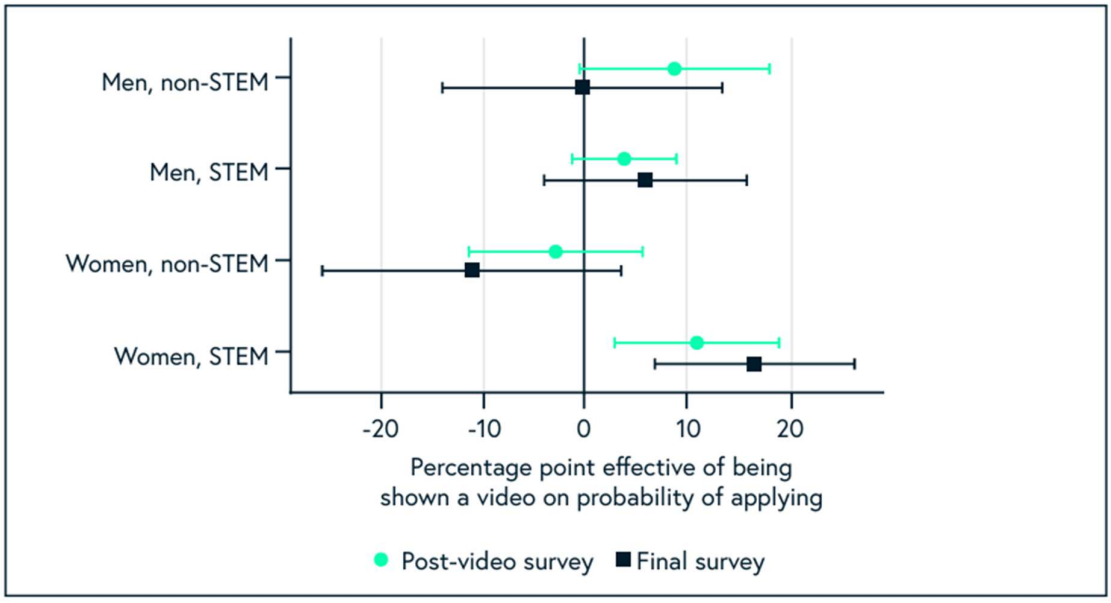


Figure 6: https://wise.theiet.org/media/blwdj0bj/belonging-perception-and-pathways-into-stem-education-1.pdf

Building better relationships between universities and schools, colleges and sixth forms is mutually beneficial. It provides a pathway for students to pursue further education at an institution they've already been exposed to.

Support can be provided in a variety of ways that are not resource intensive or financially unsustainable. Suggestions include:

Mentoring/buddying up

Use current university students to mentor Year 12 and 13 students who are considering higher education. This can help demystify the application process, provide honest insights into university life and give prospective students the opportunity to ask questions in a supportive environment. Connecting with someone who has recently navigated the same decisions can help students feel more confident

and develop a stronger sense of belonging before they arrive on campus. This aligns with wider work being undertaken by the Gender Pathways Collective's mentoring task and finish group, which is exploring how mentoring can support belonging and progression at different education stages and transition points.

Alumni role models

Schools and colleges should make use of alumni networks to showcase a range of post-16 and higher education pathways. Hearing directly from former students who have progressed into STEM degrees can help young people better understand their options and see successful role models with similar backgrounds and experiences. Alumni could be matched to students based on subject interests, university destination or career aspirations to provide more tailored support.

Peer networks

Create opportunities for students to connect with peers who share similar interests and aspirations, both in person and online. Dedicated groups, forums or networks can provide a low-pressure space to ask questions, share experiences and seek support throughout the transition to higher education. These networks can help reduce feelings of isolation and foster a sense of community before students begin their courses.

Levelling Up: STEM is a fully funded initiative currently connecting over 60 universities with local sixth form students who identify as women to help unlock their STEM potential. The IET are partners, alongside other professional institutions and third sector organisations, in the Levelling Up: Engineering programme which builds on successful Levelling Up: STEM programmes in Computer Science, Maths, Physics and Chemistry developed by founder Dr Tony Hill. The programme provides a practical example of how collaboration between schools, colleges and higher education institutions can increase exposure to STEM pathways, develop a sense of belonging, and connect young women with relatable role models and mentors.

Creating better relationships between academia and industry

Government, Skills England, universities and employers should work together to develop and embed structured industry engagement opportunities for underrepresented groups studying STEM subjects. This should include mentoring, industrial placements, work-based learning and employer-led activities that support students' sense of belonging and progression into STEM careers.

There is a drop off in careers advice and support available to young people once they're in university. Stronger links between higher education and industry can help students build confidence in their future career prospects, develop professional networks and see the relevance of their studies in real-world contexts.

Particular focus should be given to:

- Access to mentors working in STEM industries.
- Industrial placements and internship opportunities.
- Industry-led projects and guest lectures.
- Graduate employability support, including CV writing and assessment centre preparation.
- Opportunities for students to engage with alumni and early-career professionals.
- Greater employer involvement in course design to ensure students develop skills aligned with workforce needs.

Exposure to industry can strengthen students' sense of purpose, improve awareness of career pathways and help them envision themselves succeeding within STEM professions.

This is echoed in the Gender Pathways Collective's *40 by 40 Blueprint for Action*, which highlights that girls in secondary education typically report lower levels of career readiness than boys. The Blueprint also found that girls with higher levels of career readiness are significantly more likely to express interest in engineering careers. Together, this evidence reinforces the importance of sustained engagement with STEM, exposure to role models and clear progression pathways throughout education.

The IET Power Academy demonstrates how universities, employers and professional institutions can work together to strengthen pathways from higher education into industry. Delivered through partnerships between leading UK universities and major engineering employers, the programme provides undergraduate students with industry mentoring, paid summer placements, professional networking opportunities and financial support throughout their studies.

By connecting students with employers and industry professionals early in their academic journey, the programme helps build career readiness, expand professional networks and increase confidence in future career opportunities. Through these experiences, students can develop a stronger sense of belonging within both their academic discipline and the wider engineering profession.

Conclusion

The transition from post-16 education into higher education represents a critical point in the STEM talent pipeline. If the UK is to meet future skills needs and improve gender equity, increasing participation alone will not be enough. Young women must also feel that they belong.

Belonging should not be viewed as a supplementary aspect of education, but as a core component of participation, continuation and success. By embedding inclusive pedagogical approaches, strengthening relationships between education and industry, and creating environments where all students feel recognised and valued, we can support more young women to choose STEM pathways, remain within them and progress into the careers that will shape the UK's future

Creating lasting change requires collaboration across education, industry and policy. By continuing to address the barriers that women face and embedding inclusive practices throughout the education system, we can build a stronger, more innovative STEM workforce that benefits everyone.

Contact us

You can find out more about the belonging, perception and pathways into STEM education project here: Belonging, perception and pathways into STEM education

If you have any questions, please contact us at WISE@theiet.org.

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