



How to support women of all ages in post-secondary science education

Mature female students face barriers to success in STEM subjects, but steps can be taken to address this. Liette Vasseur explains what needs to be done

Equity, diversity and inclusion

STEM

Admissions

North America

Feature article



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Many women do not take a linear path from high school to university, going from baccalaureate to master's study and then PhD with no or little break. They take some time off after high school or, often, after their baccalaureate to have a family.

Concerns about missing out on having children push women to postpone or completely stop their studies to focus on parenting. Once the children are grown up enough, women may look at returning to university and completing their education.

Another influencing factor is women's need for financial independence. The pandemic has increased the pressure on women to find secure employment amid great uncertainty. Their studies, therefore, often need to fit around full- or part-time jobs.

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In Canada, as other countries, the number of women entering science, technology, engineering and mathematics (STEM), and trades is slowly increasing but challenges remain. And mature female students wanting to enrol in STEM subjects face added – often unexpected – barriers, which I explored in a 2019 report with co-author Heather VanVolkenburg, herself a mature biology student who returned to post-secondary education after having a family.

The key barriers to mature women in STEM

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Huge variations exist in terms of entry requirements among universities and colleges in Canada – even more so around the globe. But initial barriers to mature women applying to university, particularly in STEM, include:

Admissions: it can be difficult navigating websites to find admission and entry requirements, which usually differ for mature students, thus limiting them in what they can apply for and whether they can be full- or part-time. Some programmes do not offer admission to mature students. Mature students are often advised to go part-time if they want to get scholarships as they would not qualify for full scholarships.

In class: once enrolled on a programme, being accepted by fellow classmates and academics is not always easy. In labs, young students tend to team up together, leaving out mature women, while some STEM instructors do not welcome mature women as they perceive them as taking places from younger students and not being as serious about their studies.

Outside class: financial pressures, childcare and flexibility of study hours present further challenges. Childcare is generally limited to daytime hours, and it is difficult to find care for early-morning or evening classes. Financial support is limited for mature students in most universities, and mature women may struggle to access summer employment if they cannot easily relocate. In addition, several federal and provincial programmes set an age limit for their applicants.

Potential solutions to welcome women of all ages into STEM

Higher education institutions can – and should – take steps to reduce these barriers and encourage more mature women in STEM, particularly while most countries face an ongoing skills shortage in these specialisms. For example, some UK universities took steps to make courses more flexible for learners, diversifying communications about student life and providing financial advice, when they realised that more than 28 per cent of their undergraduate students were mature.

How to apply: application information for mature students needs to be easy to find and clearly and prominently displayed on institutional websites. Too often it is buried behind information for their younger peers, creating a barrier to entry.



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of discouragement. There should also be a realistic assessment of the costs of student life, with readily available advice on how to finance studies.

Broaden admissions criteria: admissions requirements should look at achievements and experience that sit outside previous academic grades, especially when high school is several years ago. They should consider past professional and lived experiences and the potential and capacity of the person to attend and flourish in a programme. In some cases, the possibility to accept them with a levelling course may be welcomed to prepare them for higher education.

Class accessibility: to ensure greater accessibility to courses, institutions can enable students to attend classes in-person or online, or a combination of the two. This added flexibility would make it much easier for mature students with other responsibilities and time demands, such as single parents or those with jobs, to attend. Lecture notes should be made available through the virtual learning environment and preparatory material provided before the start of the semester, to help with catching-up or levelling-up.

Challenge misconceptions: a common mistake is to assume that mature female students have enrolled on a course to simply “fill their time”, like a hobby. In fact, my experience working with mature women in my lab suggests that they are among the most effective and diligent students, in both their classes and their research. Institutions should ensure that faculty and staff have sufficient equity, diversity and inclusion training, particularly in unconscious bias, to prevent such misconceptions being perpetuated.

Support mature student needs: most activities on campus are organised by clubs and societies dominated by younger students. They are, therefore, shaped by what that demographic wants, such as pub crawls. Institutions should support mature students to pursue other priorities such as mentors and different modes of socialising. All institutions should have a Mature Student Society.

Proactive steps create inclusive classes: in labs, young students tend to exclude mature women from their groups for fear they will not contribute as much as well as feeling less ease and relatability than with their same-age peers.



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university, all students need EDI training, covering indigenous and international cultural issues as well as gender and race. Such learning is for life and will serve students well in their future careers.

Help with childcare: day care remains a huge challenge for women, especially single parents, interested to pursuing higher education. While in Canada, the federal programme of day care may help support in terms of costs (except in Ontario), availability is an issue. Day care centres often have limited operating hours, such as 8:30am to 5pm. This leaves the students with courses that fall outside those hours struggling to find solutions – a barrier that eliminates many single women. Solutions exist in several European countries where universities have alternative types of after-hours day care to allow attendance in the evenings. This could be replicated elsewhere.

Beyond the campus: changes need to go beyond institutions' walls. For example, many provincial and federal summer employment programmes limit the age for enrolment to 30 to 35 years old. This eliminates many mature women who would benefit from and most likely want to gain such work experience. Some are now accepting mature students due to exceptional circumstances, but this remains rare.

Removing the age limits on courses and placements would give an opportunity for mature women – and increasingly men – to continue their education and re-engage with STEM subjects and professions. Age should not be a limiting factor for learning, especially when we talk about STEM labour shortage. It is time to widen the potential talent pool.

Liette Vasseur is the UNESCO chair in community sustainability: from local to global at [Brock University](#).

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