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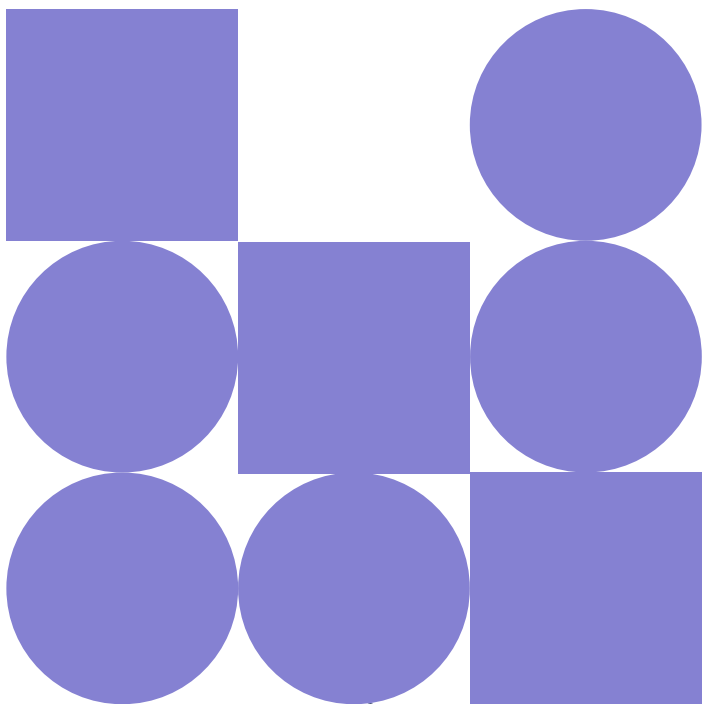
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Promoting Gender Equity in and through Education

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About the Series

The Series was started in 2000, as a joint venture between the International Academy of Education (IAE) and the International Bureau of Education (IBE). So far 34 booklets have been published in English and many of them have been translated in several other languages. The success of the Series shows that the booklets meet a need for practically relevant research-based information in education.

The series is also a result of the IBE's efforts to establish a global partnership that recognizes the role of knowledge brokerage as a key mechanism for improving the substantive access of policymakers and diverse practitioners to cutting-edge knowledge. Increased access to relevant knowledge can also inform education practitioners, policymakers, and governments on how this knowledge can help address urgent international concerns, including but not limited to curriculum, teaching, learning, assessment, migration, conflict, employment, and equitable development.

Governments need to ensure that their education systems meet their core and indisputable mandate, which is to promote learning and, ultimately, to produce effective lifelong learners. With the aggressive pace of contextual change in the 21st century, lifelong learning is a critical source of adaptability, agility to adapt, and the resilience required to meet challenges and opportunities. Yet, for many countries around the world, effective facilitation of learning remains a daunting challenge. Learning outcomes remain poor and inequitable. Intolerably high proportions of learners fail to acquire prerequisite competences for lifelong learning such as sustainable literacy, digital literacy, critical thinking, communication, problem solving, as well as competences for employability and for life. Systems' failure to facilitate learning co-exists with impressive advancements in education research, driven by research from diverse fields, including the sciences of learning, particularly the neuroscience of learning, and advancements in technology.

The IBE's knowledge brokerage initiative seeks to close the gap between scientific knowledge on learning and its application in education policies and practice. It is driven by the conviction that a deeper understanding of learning should improve teaching, learning, assessment, and policies on lifelong learning. To effectively envision and guide required improvements, policymakers and practitioners must be fully cognizant of the momentous dialogue with research.

The IBE recognizes the advancements already made, but also that there is still much more work to be done. This can only be achieved through solid partnerships and a collaborative commitment to building on previous lessons learned and continued knowledge sharing.

The Educational Practices booklets are illustrative of these ongoing efforts, by both the International Academy of Education and the International Bureau of Education, to inform education policymakers and practitioners on the latest research, so they can better make decisions and interventions related to curriculum development, teaching, learning, and assessment.

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The authors are responsible for the choice and presentation of the facts
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Introduction

Despite progress made in educational attainment of women, gender inequalities persist in and through education, modelling unequal life trajectories for students and impacting the sustainable development of nations. This contribution to the Educational Practices Series synthesises the international evidence on gender disparities in educational processes and outcomes, discusses the main implications for educators, and identifies educational practices that have the potential to promote gender equity.

The booklet focuses on three bodies of literature, deriving nine principles for educators. First, we delve into the relevance of teachers' expectations, practices, and interactions, highlighting how teachers can challenge gender bias and stereotypes in the classroom. Second, we summarize the evidence on gender gaps in educational achievement in competitive and noncompetitive standardised tests, informing how stereotype threat and other gender disparities (i.e., in risk-aversion, self-confidence, response in time-constrained environments, and willingness to compete) affect the performance of boys and girls. We also identify school and teaching practices that can contribute to reducing these gaps. Third, we focus on gender segregation across fields of study by reviewing evidence on gendered patterns of upper-secondary school specialisation and university-major choices, and on the social mechanisms that drive them. Here, we address the role of educators in weakening gender stereotypes and promoting the inclusion of men and women across all fields of study. Finally, we conclude by connecting these nine principles and highlighting their relevance in promoting gender equity in education and beyond.

1.
Teachers' gendered expectations can affect students' academic progress

Students learn more in an environment that encourages high expectations for all and promotes a positive self-concept.

What research shows

Interpersonal expectations create reality: several empirical studies have shown that teachers' expectancies affect students' academic progress. That is, teachers' expectations lead to students' achievements that are in line with those expectations. The situation where inaccurate or biased expectations produce an effect on educational outcomes is known as the Pygmalion effect (Rosenthal and Jacobson, 1968). The Pygmalion effect takes place when students internalise teachers' beliefs and adjust their behaviour to meet teachers' expectations, leading high-expectation students to perform better and low-expectation students to perform worse. Such influence on educational achievement appears to be especially significant for students from culturally stigmatised groups. Teachers' differential expectations have been mainly researched in relation to students' socioeconomic status, ethnic group, and gender, confirming the existence of small to moderate effects on academic achievement. At the basis of this self-fulfilling prophecy are teachers' verbal and nonverbal communication of differential expectations that are translated into students' academic self-concept, which consequently impacts their achievement. Further, studies have found that positively biased expectations have a long-term positive influence on students' future careers.

Teachers' expectancies for children's maths, science, and literacy competences are often gender biased and can influence children's attitudes toward and performance in these areas. For example, pre-service and in-service teachers tend to show gender-stereotyped beliefs about their students' maths abilities; in several national contexts, teachers believe that boys have higher maths ability than girls. This is particularly important as girls have been found to be more vulnerable to self-fulfilling prophecies regarding their maths abilities than boys. Teachers also show gender biases in their attributions of maths success: they tend to attribute boys' maths successes predominately to ability and girls' maths successes to effort. Conversely, teachers are more likely to attribute girls' failures to lack of ability and boys' failures to lack of effort.

Teachers who have lower expectations in general for their students, or toward particular groups of students, provide fewer opportunities to learn for these students.

Fortunately, teachers' biased expectations are not static; they can be modified through supportive interventions aimed at changing teacher behaviour, creating awareness of expectations effects, and addressing the beliefs underlying their expectations.

In the classroom

A first step toward creating gender-inclusive classrooms is that teachers reflect about their own biases and stereotypes (for example, Do I believe that girls have higher literacy competence and that boys are more likely to succeed in maths and science? How do these expectations affect my teaching and the learning environment for boys and girls in my classroom?).

It is very important that teachers communicate high expectations and promote positive academic self-concept for every student. To this end, educators should be aware of the impact of their expectations on their students' academic progress and educational trajectories and reflect on the beliefs underlying their expectations.

Further, effective and inclusive teachers nurture a growth mindset in their class, by valuing and emphasising the role of effort and perseverance over talent or innate ability. Promoting a growth mindset involves challenging the belief that cognitive abilities are static. Teachers can achieve this by focusing on learning growth, transmitting the willingness to accept new challenges, and teaching students to learn from failure.

Suggested readings: De Boer, H. et al., 2018; Gunderson, E. A. et. al., 2012; Li, 1999; Mizala, A. et. al., 2015; Retelsdorf, J. et. al., 2015; Tiedemann, J. 2000; Wolter, I. et. al., 2015.

2.
Textbooks and classroom materials can convey gender stereotypes

Teachers can discuss and problematize gender stereotypes in teaching resources with students.

What research shows

Gender stereotypes are structured and socially shared sets of beliefs about personal attributes (such as interests, competences, and roles) of men and women. In the context of education, gender-stereotyped expectations particularly relate to interests, abilities, and vocational aptitudes attributed to girls and boys. These gendered expectations have a strong impact on girls' and boys' educational outcomes and trajectories.

One of the ways in which schools communicate gender stereotypes is through teaching materials. Several studies have shown the prevalence of gender stereotypes in textbooks: female characters are less frequently depicted, particularly in materials related to science, technology, engineering and math (STEM); are more likely to be portrayed in fields of action related to family and household; and tend to be represented as passive and submissive. Men in turn, are more likely to be represented at their job and to be portrayed as more active, individualistic, competitive, and willing to take risks.

It is important to note that not only textbooks and classroom materials can convey gender stereotypes. Patterns of underrepresentation of females and stereotypes of both genders' occupational and household roles are also found in children's picturebooks and in teacher education materials. These socially legitimised education resources reinforce a "hidden curriculum", constraining girls' and boys' visions of who they are and what they can become.

In the classroom

While the design of textbooks and, more broadly, the curriculum goes beyond the responsibility of teachers, it is important that teachers are aware of the extended presence and impact of gender stereotypes in teaching resources. When possible, educators should avoid the uncritical use of teaching materials conveying gender

stereotypes or depicting gender-biased visuals. Teachers can reflect on, explicitly address, and problematize gender stereotypes in teaching resources with students.

Also, when designing teaching materials, it is important that educators include diverse role models for boys and girls, and aim for a balanced representation of men and women. This can be achieved, for example, by acknowledging the important contributions of women to traditionally male-dominated fields, such as mathematics, science, and technology. This will help transmit the message to children that both men and women can participate and excel in all fields.

Suggested readings: Blumberg, R.L., 2008; Hamilton, M. C. et al., 2006; Kerkhoven, A. H. et al., 2016; Kollmayer, M. et al., 2016; Stromquist, N. P., 2007; Zittleman, K. & Sadker, D., 2002.

3.
Teacher-student interactions in the classroom can be gender biased

It is important for boys and girls to be equally included in classroom interactions.

What research shows

Teachers' subjective understandings of their students' cognitive abilities have important implications for classroom interactions, children's access to learning opportunities, and educational equity more broadly. In particular, gender-biased teacher expectations translate into differentiated stimuli, teaching practices, and interactions directed toward boys and girls.

Indeed, gender differences permeate teacher-student interactions: in maths and science classrooms, boys tend to receive more attention from their teachers than girls, particularly by being approached more frequently, being asked more complex questions, and receiving more feedback and personalised support. Boys also tend to initiate more interactions with teachers than their female peers and dominate classroom discussions and spontaneous participation. In turn, girls are generally less frequently addressed by their teachers, and those who belong to discriminated ethnic minorities or racialised groups are more likely to experience negative teacher-student interactions than their peers.

Interestingly, the evidence shows that female teachers are not necessarily more inclusive of girls in classroom interactions than male teachers. As well, studies have not established a robust and consistent association between female student participation and the gender composition of the class. Instead, differences in the inclusion of girls in classroom interactions are generally explained by teachers' biases, regardless of their gender.

The frequency and quality of teacher-student interactions have impacts on a wide range of educational outcomes, such as student learning, motivation, and socio-emotional development. Further, the quality of interpersonal relationships with teachers is particularly important for girls' achievement trajectories. Thus, it is key to promote equal learning opportunities and pedagogical interactions for boys and girls.

In the classroom

In inclusive classrooms, teachers provide a supportive and welcoming learning environment, encourage frequent student participation, and balance their attention between girls and boys. Implementing a random call system or specifically addressing and encouraging the participation of those students who are less likely to volunteer are ways to improve equity in classroom interactions.

Teachers should constantly monitor the social dynamics of the classroom and promote the equitable and respectful participation of boys and girls in classroom interactions. Educators can nurture an integrated classroom climate by encouraging frequent communication and collaborative work among students of different genders. It is also important that teachers examine their language and include neutral and inclusive words when communicating with students. This will contribute to all students feeling acknowledged and valued in the classroom.

Suggested readings: Eliasson, N. et al., 2016; Jones, S. M. & Dindia, K.. 2004; McCormick, M. P. & O'Connor, E. E. 2015; Morris, E. W. & Perry, E. L., 2017; Ortega, L. et al., 2021.

4.
Gender stereotypes affect academic performance in different fields

Gender balance can be promoted by recognizing the contributions of both men and women across fields of study.

What research shows

International evidence has shown significant differences in the academic performance of male and female students across various subjects. For instance, according to the 2018 Programme for International Student Assessment (PISA), female students, on average, scored better than males in reading tests. Meanwhile, when it comes to maths and science, although there are more boys than girls among the low achievers, there are also more boys among those who excel in these subjects.

Having fewer women among the high achievers in maths and science is usually related to social stereotypes and their effects on students' confidence in their own abilities. Specifically, women have been negatively stereotyped as less able in those subjects, which have been stereotyped as masculine fields. These stereotypes are reinforced through educational resources that portray more men in said areas and can also be communicated by parents and teachers, when their expectations about students' performance and careers are affected by gender biases.

Female students generally have less confidence in their own ability in maths and science and also experience more anxiety toward maths, potentially due to the internalisation of social stereotypes. Furthermore, women care more about the expectations of their significant others. Consequently, these gender differences may impact students' academic performance in these fields.

In the classroom

Social stereotypes and gender-based expectations affect students' motivation, self-concept, and performance in different subjects. Therefore, lesson design must consider actions to reduce them, compensate them, and avoid their negative impact.

One way to move in that direction is to promote both female and male students' interest in different subjects. This implies, when teaching typically masculinized areas — such as maths and science — paying particular attention to promoting not only boys' but also girls' motivation. Also, in typically feminised areas, such as language, teachers should aim to promote not only girls' but also boys' motivation. To this end, when designing lessons and choosing examples, exercises, and material, such as books, videos, etc., it is important to include a variety of plans and resources that may appeal to students with different interests. This can be done, for example, by highlighting women's contributions to STEM areas — typically masculinized fields -- and men's participation in social sciences and humanities — typically feminised fields.

However, promoting both male and female students' interest in different fields and subjects is not enough to close the gender gap; it is also crucial to strengthen students' confidence in their own abilities in these subjects. For this purpose, it is relevant to communicate that mistakes are a natural part of the learning process, provide positive feedback, recognize the strengths of all students, and reinforce the message that it is always possible to improve.

Suggested readings: Carlana, M., 2019; Encinas-Martín, M. & Cherian, M., 2023; OECD, 2015, 2019.

5.
Gender differences in risk-aversion, willingness to compete, and self-confidence can lead to gender gaps in competitive tests

Teachers should consider that competitive environments can undermine the performance of girls.

What research shows

Several studies have found that women are less willing to compete with others and are more risk-averse than men, although these patterns can vary across cultures. In addition, women tend to have less confidence in their own skills, with a larger gender gap in perceived performance than in actual performance. In the case of maths, the self-confidence gap is larger for high-achieving students; in particular, female high-achieving students have lower self-confidence than their male counterparts. This is probably due to social stereotypes: given the social stereotype that mathematics is a male field, female students who perform outstandingly in mathematics are more likely to be exposed to the stereotype, for example by receiving comments such as "your performance is impressive for a girl". This can undermine women's self-confidence, make them feel out of place, and diminish their expectations of success in said field.

Studies focused on students in secondary and post-secondary education have explored how gender gaps vary when comparing high-stakes competitive tests with less competitive or noncompetitive tests. Results from research conducted in different countries and on different subjects show that competitive high-stakes tests negatively affect women's performance. In the case of maths, this is especially true for high-achieving students. Meanwhile, in language, this negative effect is not specific to a given achievement level; gender gaps in risk aversion and willingness to compete may be drivers of this phenomenon. Furthermore, since gender gaps in competitive maths tests are larger for higher-achieving students, larger gender gaps in self-confidence in that area may be another factor at play.

In the classroom

Gender differences in performance in competitive environments should lead our attention to the learning and assessment activities included in school courses. When designing learning activities, noncompetitive tasks, such as those that do not involve identifying winners or that promote cooperation among students, may be more effective in encouraging the participation of some groups of students. If competitive tasks are to be included as learning activities, it is important to balance them with other kinds of activities where women are more willing to participate and that allow them to demonstrate their cognitive abilities to a greater extent.

Moreover, when it comes to student assessment, teachers have to decide how many assignments and tests a course will have and how much they will weigh in the final grade. When making such a decision, it is important for teachers to consider that test stakes affect gender gaps. In cases where improving students' achievement in competitive environments is not the aim of the course, low-stakes assessment can be more effective in measuring students' cognitive abilities and preventing the exacerbation of gender gaps. Thus, doing a series of lower-stakes quizzes instead of fewer high-stakes exams can be a better strategy.

Nonetheless, we acknowledge that there are cases where improving the ability of students to perform in competitive environments can be a desired outcome of the educational process. In such cases, an emphasis on improving ability should be explicitly incorporated into the school curriculum. Furthermore, teachers should prepare students to perform in contexts of risk and competition by enhancing the development of their socio-emotional skills. This can be achieved by promoting activities that strengthen students' self-confidence and their ability to control their anxiety and stress.

Suggested readings: Arias, O. et al., 2023; Croson, R. & Gneezy, U., 2009; Falk, A. & Hermle, J., 2018; Niederle, M. & Vesterlund, L., 2010; Preckel, F. et al., 2008; Sutter, M. et al., 2019.

6.
Gender stereotypes can occupy mental resources needed for cognitive tests

Students' awareness of gender stereotypes can decrease the negative effect of stereotypes on cognitive test performance.

What research shows

People belonging to negatively stereotyped populations may face what is known as the "stereotype threat", a phenomenon where they are at risk of confirming the stereotype associated with their group as a personal characteristic. This occurs because when they are stressed, trying to actively monitor their performance, and striving to suppress their negative thoughts and emotions, there is a working memory overload, limiting their ability to respond appropriately to a stressful situation. For instance, when taking a test, these processes can use mental resources that might otherwise help the student to perform better.

As a consequence of the stereotype threat, performance tests may underestimate the cognitive abilities of people from groups stereotyped as low performing. One example is women who have been subject to such negative stereotyping in relation to their maths competence. In fact, studies have found that stereotyped environments negatively affect women's performance, especially for those who strongly identify with a female gender. It is possible that the stereotype threat could also affect male students' performance in feminised domains. However, this phenomenon has been less studied, and evidence is still inconclusive.

In the classroom

Even when social stereotypes are deeply rooted in society and seem hard to change, action can be taken. For teachers, the first step is to pay attention to their own language and that of their students, so as to avoid the reproduction of social stereotypes linking males and females with certain occupations and abilities.

However, as social stereotypes exist beyond the classroom, social stereotypes can impact students' performance even in a low-stereotyped class environment. Thus, it is important for teachers to talk about

this phenomenon with students and their families, helping them to recognize social stereotypes and understand their harmful effects on achievement. In particular, teachers could let students know that they can get low scores on a given test for reasons other than low cognitive ability, such as stereotype threat and test anxiety. This information can help students to avoid labelling themselves as "bad" for a given subject, which could diminish their self-confidence.

Furthermore, studies have shown that describing a test as one that does not produce gender differences or acknowledging that social stereotypes can interfere with women's maths performance has helped to decrease gender achievement gaps. Thus, before administering tests to secondary-education students, reminding them that there are no inherent gender differences in the abilities being measured can help to mitigate the stereotype threat effect on students' performance

Suggested readings: Johns, M. et al., 2005; Nguyen, H. H. D. & Ryan, A. M., 2008; Schmader, T. et al., 2008; Shih, M. et al., 1999; Spencer, S. J. et al., 1999.

7.
Test designs are not gender neutral

Teachers can design tests to avoid gender biases that favour male or female students.

What research shows

As has been mentioned, competitive high-stakes tests have a negative effect on women's academic performance. However, many other exam features can also impact gender gaps in achievement. One of them is time pressure. Analyses of chess matches and of maths, spatial, and verbal ability tests have shown that women underperform men in time-constrained contexts.

Moreover, a test's scoring system also has implications for gender gaps. When incorrect answers are penalised by a system that deducts scores in the test, women skip more questions than men. As a result, penalising wrong answers increases gender gaps favouring male students' performance.

In addition, the type of test questions can lead to item bias, which is the phenomenon in which examinees perform differently due to causes unrelated to the construct being measured. In fact, maths and reading tests with a higher number of multiple-choice items favour male performance over female performance, while tests that include more constructed-response items -- i.e., where students are required to elaborate their own answer (for example, by writing or drawing a graphic representation) -- benefit females over males.

Furthermore, item content is also relevant as students' confidence in their ability to solve a task is often dependent on the content of the task at hand. For example, gender self-confidence gaps favouring males are more noticeable in maths problems with gender-stereotyped content, such as calculating the petrol consumption rate of a car. On the other hand, in abstract problems, like estimating a quadratic equation, there is practically no gender difference.

In the classroom

Given that test designs are not gender neutral; it is important to consider how the different test components affect gender achievement

gaps when one is designing the assessment of a given course. Unless time restriction is relevant to the ability or knowledge being assessed, giving students more than enough time to solve quizzes and exams can prevent the exacerbation of gender gaps. In addition, avoiding test designs that penalise wrong answers can serve the same purpose. Furthermore, both measures can reduce the stress and anxiety associated with the test, enhancing its capacity to measure students' true cognitive abilities and favouring many students affected by these two phenomena.

 Along the same lines, test design should also consider how specific questions or exercises may exacerbate gender gaps. Specifically, teachers could balance multiple-choice and constructed-response questions to avoid favouring students of one gender for reasons other than the knowledge and/or skills being measured. Moreover, the content of the questions is also relevant. It is very common to have mathematics tests that ask students to solve contextual problems and language tests that ask students to read a text.

In these cases, it is important that teachers are aware that the topics selected may affect student performance. Therefore, avoiding gender-stereotyped content and prioritising the use of a variety of topics that may appeal to different students can help prevent the exacerbation of gender achievement gaps.

Suggested readings: Coffman, K. B. & Klinowski, D., 2020; De Paola, M. & Gioia, F., 2016; Reardon, S. F. et al., 2018; Schulz-Heidorf, K. & Støle, H., 2018; Taylor, C. S. & Lee, Y., 2012.

8.
Gender segregation across fields of study

Teachers can include various role models in the classroom and in teaching materials to help reduce gender stereotypes.

What research shows

Worldwide, men are overrepresented in higher education STEM majors, while women are overrepresented in the fields of social sciences, humanities, arts, education, and health. One also observes gender segregation within study areas: in STEM programs, women tend to be overrepresented in life sciences and biology, and under-represented in more maths-intensive scientific fields. Similarly, in the social sciences, males tend to be overrepresented in economics and mathematical methods for social sciences while underrepresented in other disciplines.

Student choices in upper-secondary education also show a gendered pattern: males are more likely to choose STEM elective courses and specialisations while females tend to select those related to language, humanities, life sciences, health, and social sciences. Further, it has been suggested that students' course and specialisation choices in secondary education predict their field of study in higher education.

This gender segregation, observed in education systems and later in the labour market, is rooted in a series of inequalities through-out men's and women's lives. One of the main explanations for horizontal segregation emphasises the role of the cultural environ-ment, which reproduces gender stereotypes, restricting and shaping individual choices. The development and reproduction of gender stereotypes occur early in life, being extremely relevant experiences and interactions in the family and school since they can impact the stimuli received, skill development, and the preferences of girls and boys. This happens through processes of socialisation and interac-tions with peers/friends, parents, educators, and counsellors, where girls are more encouraged than boys to choose fields of study related to emotional and nurturing tasks and those in which reading skills are central.

An important finding from the literature is that the influence of peers, parents, and teachers' beliefs and practices, as well as that of role models, can modify gendered educational choices.

In the classroom

It is important that teachers include various role models in the classroom to help reduce gender stereotypes. For example, they can invite women scientists or men working in the humanities to give talks in schools, highlighting the contribution of women in STEM fields and men in feminised areas. It is important to share examples of individuals who have defied gender norms and achieved success in their chosen fields. Teachers should highlight the accomplishments of women in STEM, men in caregiving professions, and individuals who have pursued unconventional career paths. Hearing about the experiences and successes of people who have pursued nontraditional career paths can benefit students by making them feel that different careers are viable and desirable options.

Teachers may want to consider a number of resources, including books, articles, websites, and documentaries that showcase gender-atypical career choices, making these resources readily available to students so they can explore and gain insight into various fields.

Also, teachers can inform female students about the initiatives that exist to promote their insertion in the sciences, such as the existence of gender quotas in certain universities and programs, or training opportunities aimed at girls and young women in topics such as programming.

When talking about areas of specialisation or career options, it is relevant to provide students with a wide range of options that go beyond traditional gender norms. Teachers and counsellors should encourage students to explore their interests and passions regardless of societal expectations.

Suggested readings: Barone, C., 2011; Bordon, P. et al., 2020; Bertocchi, G. et. at. 2022; Charles, M. & Bradley, K., 2009; Ortega, L. et al., 2023.

Teachers and the school environments at high school are crucial in shaping college-major preferences

Teachers can include various role models in the classroom and in teaching materials to help reduce gender stereotypes.

What research shows

Researchers have mainly studied the effect of teacher-student gender match in relation to student academic achievement; there is scant research on how it predicts field of study choices. However, recent studies show that female students exposed to a higher proportion of female STEM teachers during secondary education are more likely to enrol in tertiary STEM programs.

Also, there are other aspects of school culture that may affect gender segregation across study fields. Some studies highlight the importance of early encouragement to reduce gender differences in science and engineering degrees: if female high-school seniors have the same orientation and preparation for science and engineering fields as their male peers, the gender gap closes significantly. Moreover, the literature has found a substantial effect of two school characteristics on the gender gap in plans to major in STEM fields in college: a school's curriculum in STEM; and gender segregation in extracurricular activities.

An important implication of these studies is that the school environment can modify gender preferences: the secondary school context matters as a social context in which widely shared beliefs about gender are challenged or reinforced.

In the classroom and at school

Addressing career segregation according to gender requires different measures, one of which is having a school curriculum that offers early preparation in science and engineering fields. Encouraging girls from an early age, providing them with opportunities to develop STEM skills, and promoting a supportive learning environment can allow them to build their confidence to pursue STEM careers. A curriculum

that is inclusive and diverse and that highlights the achievements of women in STEM can inspire and empower girls to pursue these fields.

Also, it is important to promote gender-inclusive extracurricular activities, provide role models, and create supportive environments. For example, if certain extracurricular activities are predominantly associated with boys or girls, it may limit opportunities for students to explore various interests. Girls who are interested in STEM may face barriers or social pressures that discourage their participation in activities traditionally associated with boys. By challenging stereotypes, providing equal opportunity, and promoting a sense of belonging, teachers and schools can empower more women to pursue STEM careers and help close the gender gap in these fields.

The curriculum and extracurricular activities can also influence parents' perceptions and expectations about their children. If these elements reinforce gender stereotypes or limit girls' opportunities in STEM, they can affect the support and encouragement they receive from their family. Involving parents and educating them about the importance of gender equity in STEM education can help balance these influences.

Suggested readings: Legewie, J. & DiPrete, T., 2014a, 2014b; Phelps, L. A, et. al., 2018; Law, H. & Schober, P, 2022.

Conclusion

These nine principles highlight and bring together several forms in which gender stereotypes permeate educational processes, and underline their effects on students' outcomes and trajectories.

Gendered socialisation leads to gender differences in education and restricts both men and women from realising their full potential. While schools are not the only social space of gender-stereotypes transmission, they can play a key role in ensuring that educational processes do not reproduce traditional gender roles and stereotypes, which perpetuate inequalities between men and women.

It is important to become aware of gender biases and construct changes from early childhood. The task of parents and teachers is to open the world to girls and boys, broadening their horizons and allowing them to develop their interests and abilities in various areas. A greater participation of women in the scientific world, in politics, and in senior positions in companies is also relevant, since role models have a significant effect on boys and girls.

Promoting a greater participation of women in today's masculinized activities not only benefits women but also society as a whole, because although talents are distributed equitably by gender, the same is not always the case with opportunities. It is also important to promote the participation of men in areas that are currently feminised, as they can also contribute to those fields, but they are usually socially discouraged from pursuing such careers. Overall, promoting a shift away from gender stereotypes expands students' opportunities and, by doing so, it creates spaces that better reflect the richness and breadth of society. This, in turn, can positively impact our communities, as diverse environments foster new questions, new approaches, and better answers.

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