Gender Differences in Education, Skills and STEM Careers in Latin America and the Caribbean

Insights from PISA and PIAAC

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Preface

The pursuit of gender equality in education, skills development, and career opportunities underpins sustainable social and economic progress. This report contributes to the OECD's efforts to promote inclusive growth and tackle gender disparities in Latin America and the Caribbean (LAC). Using data from international assessments like the Programme for International Student Assessment (PISA) and the Programme for the International Assessment of Adult Competencies (PIAAC), the OECD highlights the importance of achieving gender equality as a driver of economic growth and societal well-being.

While the LAC region has made significant strides in participation rates for primary education, challenges persist in secondary education, where enrolment has improved since 1990 but stands at 79%, trailing the OECD average of 93%. Boys, in particular, face lower completion rates for upper secondary education compared to girls, with a 61.5% for boys compared with 68.7% for girls. A similar trend is also seen in tertiary education, over 60% of women in LAC are enrolled, compared to fewer than 50% of men.

Drawing from PISA 2022, the report finds that the gender gap in mathematics performance in LAC, with boys outperforming girls by 8 score points, is slightly smaller than the OECD average of 9 score points. However, there are stark disparities in boys' and girls' expectations to pursue STEM careers. Across OECD countries, only 16% of top-performing 15-year-old girls anticipate working in STEM professions, compared to 22% of boys. In most LAC countries, expectations are even lower, with only between 5 to 19% of girls aspiring to STEM-related fields, half the level of boys.

This report also examines the barriers to achieving gender equality in STEM education and careers in LAC, providing analyses of the disparities observed in the region. It proposes actionable strategies to address these challenges, fostering inclusive teaching methods, engaging parents to reshape perceptions, promoting female role models and mentoring, and expanding access to STEM career information. Workplace policies that support women's retention in STEM, targeted scholarships and research grants, and cross-sectoral alliances to drive systemic change are also among the recommended initiatives.

Policymakers, educators, and stakeholders will find in this publication evidence-based insights and recommendations aimed at fostering gender equity, especially in STEM fields. This report aspires to inspire transformative actions that advance the economic and social progression of LAC countries. We trust that this publication will serve as a useful resource for all those committed to advancing gender equality in education and beyond.

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Foreword

Latin America and the Caribbean (LAC) is a region of vibrant diversity and rich potential, but faces persistent inequalities. Among these, gender disparities in education, skills development, and career opportunities—particularly in science, technology, engineering, and mathematics (STEM)—continue to limit the full realisation of inclusive growth and social progress.

The OECD Latin America and the Caribbean Regional Programme (LACRP) was launched in 2016 to support the region in advancing more inclusive and sustainable development. The Programme fosters dialogue and cooperation between LAC countries and the OECD, structured around four interrelated priorities: increasing productivity, strengthening institutions, and enhancing social inclusion and ensuring environmental sustainability. These pillars guide our work to support evidence-based policy reforms across the region.

This publication is a concrete outcome of the priority on social inclusion, reflecting the shared commitment of LAC countries to reduce inequality and promote equal opportunities. It responds to the mandate set forth by Ministers and high-level representatives during the OECD-LAC Ministerial Summit held in Bogotá in 2024. Under the theme “Productive Inclusion Revisited,” participants called for renewed efforts to address structural barriers to equality—among them, the gender gaps that continue to affect access to quality education, skills development, and the transition to the labour market, especially in high-demand sectors like STEM.

Drawing on internationally comparable data and policy insights, this report highlights the progress made across LAC countries while also identifying the persistent challenges that require urgent attention. It underscores the importance of tackling gender stereotypes from early childhood education, improving the alignment between education systems and labour market needs, and designing skills policies that empower all learners—especially girls and women—to thrive in a rapidly evolving world of work.

We hope that the evidence and policy guidance offered in this publication will support governments, educators, employers, and civil society actors across the region in advancing gender equality in education and skills. Achieving this goal is a prerequisite for unlocking the full potential of the region’s human capital and building more resilient and inclusive societies

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The authors of this report are Marta Encinas-Martín and Michelle Cherian. The report benefited from valuable comments from William Thorn, Miyako Ikeda, Andrea Hofer, Sara Grubanov-Boskovic, and Jonathan Diaz. Clara Young edited this report.

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Abbreviations and acronyms

CEDLAS	Center for Distributive, Labor and Social Studies
CIESAS	Centro de Investigaciones y Estudios Superiores en Antropología Social
EAG	Education at a Glance
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
ECLS	Early Childhood Longitudinal Studies
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IaDB	Inter-American Development Bank
IDRC	International Development Research Centre
INES	OECD Indicators of Education Systems
LAC	Latin America and the Caribbean
NASA	National Aeronautics and Space Administration
NGO	Non-governmental Organisations
OECD	Organisation for Economic Co-operation and Development
OEI	Organization of Ibero-American States
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PSTRE	Problem Solving in Technology-Rich Environments
SEDLAC	Socio-Economic Database for Latin America and the Caribbean
STEM	Science, Technology, Engineering and Mathematics
STEP	Skills Towards Employability and Productivity
TALIS	Teaching and Learning International Survey
UIS	UNESCO Institute for Statistics
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
WIN	Women at Intel

Executive summary

This OECD report, *Gender Differences in Education, Skills and STEM Careers in Latin America and the Caribbean: Insights from PISA and PIAAC*, presents a detailed analysis of gender disparities in educational attainment, academic outcomes, career choice, and labour market participation in the LAC region. Drawing on data from the Programme for International Student Assessment (PISA), the Programme for the International Assessment of Adult Competencies (PIAAC), and Education at a Glance (EAG), the report provides a comprehensive view of where progress has been made and where challenges remain, especially in relation to STEM pathways. The report is divided into six chapters as follows:

Introduction

Gender equality in education is not only a matter of social justice but also a cornerstone for economic growth, productivity, and societal well-being. While girls are more likely to be excluded from education at the primary level in low-income backgrounds, boys are increasingly disengaged as education progresses, facing higher repetition and dropout rates. The report notes that although LAC countries have made strides toward closing gender gaps in education, significant disparities persist across attainment, performance, and career outcomes.

Attainment of secondary education and early school leaving

While primary school enrolment in LAC is nearly universal at 97% for both girls and boys, net secondary school enrolment remains at 79%, 14 percentage points below the OECD average. Completion rates in secondary education average 65.7% across the region, with a wide variation between countries. Costa Rica and Mexico saw improvements of more than 10 percentage points in upper secondary attainment among 25–34-year-olds between 2016 and 2023, yet around 38–42% of young adults in both countries still lack this qualification. Grade repetition, which negatively affects performance and increases dropout risk, remains more common among boys. For instance, Colombia's repetition rate nears 40%. Upper secondary completion among girls averages 68.7%, compared to 61.5% for boys. Early school leaving remains high: 19% of 18–24-year-olds are not in education and have not completed secondary school. Boys, particularly from disadvantaged backgrounds, are more likely to leave early, often influenced by labour market opportunities and cultural expectations.

Gender differences in academic outcomes of 15-year-old students: Results from PISA 2022 in Latin America and the Caribbean

Performance in foundational skills remains a concern. In PISA 2022, 75% of 15-year-olds in LAC scored below the basic proficiency level (Level 2) in mathematics and 55% in reading. Disparities are pronounced among vulnerable groups: 88% of the most disadvantaged performed below proficiency in mathematics versus 55% of the wealthiest. Gender gaps mirror global patterns: boys outperformed girls in mathematics by 8 points on average in LAC (9 points in the OECD). However, in Jamaica and the Dominican Republic, girls outperformed boys in mathematics by 13 and 4 points, respectively. Girls outperformed boys in reading in all LAC countries except Costa Rica and Chile, where no significant differences were observed. The largest reading gender gaps in favour of girls were seen in the Dominican Republic and Jamaica (35 and 34 points). Science performance showed less consistent patterns: boys outperformed girls by 4 points on average, with significant male advantages in countries such as Costa Rica and Chile (15 and 14 points), while girls outperformed boys in Jamaica and the Dominican Republic. In mathematics, girls were more likely to be low performers, except in Jamaica. In the Dominican Republic, 93% of girls and 92% of boys scored below Level 2.

Career choice by gender: How girls and boys choose different fields of study, especially in STEM

Gendered expectations shape career paths early. In LAC countries, only 14% of girls expected to work in a STEM-related occupation compared to 26% of boys. This expectation gap persists into adulthood: only 30% of adults aged 30–40 in STEM-related occupations are women. Girls are more likely to express a lack of confidence in mathematics and science. For instance, just 27% of girls reported confidence in mathematics compared to 45% of boys. Domestic responsibilities disproportionately affect girls, especially during adolescence. Prior to the COVID-19 pandemic, girls in Bolivia, Guatemala, and Nicaragua already spent 3–4 hours per day on care work, compared to less than 2.8 hours for boys. The pandemic intensified this burden. In Ecuador, girls spent 3.8 more hours per week than boys on household tasks. These inequities, compounded by school closures that lasted an average of 70 weeks in LAC—29 weeks longer than the global average—have widened learning and participation gaps.

Gender gaps in adult skills and labour market outcomes in Latin America and the Caribbean

In adult skills measured by PIAAC, the gender gap in numeracy is larger than in literacy. In Peru and Chile, men outperformed women in numeracy by 16 and 21 points, respectively, rising to 19 and 24 points among adults aged 25 and over. In contrast, among younger adults, the gender gap shrinks to 5 points in Peru and 8 points in Chile. Problem-solving in digital environments shows smaller but still significant gaps: in Chile, 17% of men reached Levels 2 or 3 compared to 12% of women. In Ecuador, 35% of women had no computer experience or failed the ICT core test, compared to 31% of men. Labour market disparities remain stark. Women in LAC have a labour-force participation rate of 58%, compared to 82% for men. Wage disparities are also significant: women earn 22% less than men in equivalent roles. Occupational segregation is entrenched: 70.2% of science and engineering professionals are men, while 71.4% of health professionals and 62.5% of teachers are women.

Gender gaps in STEM education and careers in LAC: Understanding the barriers and policy messages for shaping inclusive pathways

Persistent underrepresentation of women in STEM stems from structural inequalities, stereotypes, unequal care burdens, and lack of support systems. Women represent only 22% of ICT graduates and 35% of engineering graduates. The report identifies a lack of role models, gendered perceptions of ability, and differential access to mentorship as key barriers. Crisis like COVID-19 tend to exacerbate existing inequalities, and care responsibilities continue to limit girls' and women's educational opportunities and career mobility.

Policy Recommendations

The report calls for comprehensive and inclusive educational strategies to encourage more girls into STEM careers. Key recommendations include:

- Expanding scholarship and support programmes for girls, particularly in rural and disadvantaged areas.
- Promoting STEM participation through mentorship initiatives and awareness campaigns.
- Strengthening early interventions to reduce school dropout rates among boys.
- Training teachers to use gender-sensitive pedagogies and addressing biases in classroom practices.
- Implementing institutional reforms such as anti-discrimination policies in schools and promoting flexible, inclusive curricula.

- Enhancing data systems to monitor progress and accountability in gender equity.

By addressing these disparities and implementing the proposed policy recommendations, LAC countries can unlock significant economic and social benefits, driving progress toward a more equitable and prosperous future for all.

1 Introduction

This introductory chapter explores the critical role gender equality in education plays in fostering broader social and economic development. It highlights that achieving gender equality is not only a matter of social justice but also a catalyst for economic growth and societal well-being. The chapter outlines how educated women positively impact the labour force, income levels, and intergenerational benefits while emphasising the negative consequences of gender disparities on economic opportunities and overall development. The narrative further explores the long-term implications for economic growth, labour market participation, social mobility, and health outcomes, stressing the importance of inclusive strategies that support both girls and boys in education systems. The chapter concludes with an overview of progress and persistent challenges in Latin America and the Caribbean (LAC), setting the stage for the more detailed analyses presented in subsequent chapters.

Gender equality in education is a cornerstone of broader social and economic development. Achieving gender equality in education is not merely a matter of social justice: it is a catalyst for economic growth and societal well-being. As OECD research shows, educated women are more likely to participate in the labour force, earn higher incomes and contribute to the health and education of their families, thereby fostering intergenerational benefits. Conversely, gender disparities in education can limit economic opportunities and hinder overall development.

Gender disparities in education also have long-term implications for economic growth, labour market participation and social mobility. Research suggests that gender inequality in education limits human capital development and reduces overall productivity (Klasen, 2002). The World Bank estimates that closing gender gaps in education could contribute an additional 1% to annual GDP growth in many LAC countries (World Bank, 2022). Similarly, a simultaneous closing of the gender gaps in labour force participation and working hours may increase potential GDP per capita growth by an additional 0.23 percentage point per year, resulting in a cumulative increase of 9.2% in GDP per capita by 2060 compared to baseline projections (OECD, 2023). There is also evidence that raising women's labour-force participation rate to that of men in specific countries would, for instance, raise GDP in the United States by 5%, in Japan by 9%, in the United Arab Emirates by 12% and in Egypt by 34% (Aguirre, 2012[1]). Other studies have shown that reducing gender-based discrimination in social institutions could – depending on the chosen scenario – lead to an annual increase in the global GDP growth rate of between 0.03 and 0.6 of a percentage point by 2030 (Ferrant and Kolev, 2016[2]).

Beyond economic considerations, gender gaps in education reinforce traditional gender roles and limit opportunities for women in leadership and decision-making positions. Countries with greater gender equality in education tend to experience improved health outcomes and greater female representation in politics and governance (UNESCO, 2021). Women are also more likely to invest their resources in education and the health of their children, building human capital to fuel future growth (Schultz, 2002). Helping women fully participate in the economy is not only growth-promoting, but it also diversifies economies, reduces income inequality, mitigates demographic shifts and contributes to financial sector stability (Gonzales et al., 2015; Kochhar, Jain-Chandra and Newiak, 2017). Moreover, an analysis of 17 years of data from the United States, Canada, Europe, Australia, New Zealand, and Japan finds that promoting gender equality is linked to higher levels of subjective well-being and improved quality of life for everyone, not just women (Audette, Lam and O'Connor, 2019[3]).

While much of the global focus rightly remains on improving outcomes for women and girls – who have historically faced systemic barriers to education – it is equally important to recognise and address the growing disengagement of boys in education systems. Girls are more likely to be out of school at the primary level, particularly in lower-income settings, due to structural and cultural barriers.

However, as education levels advance, boys face significant challenges of their own. They are more likely to repeat grades, underperform academically and drop out before completing secondary school (UNESCO, 2022). Factors such as poverty, the pressure to join the labour force early and gendered norms that discourage academic interest among boys contribute to higher dropout rates and lower educational attainment among boys. This underscores the need for inclusive strategies that support all learners.

Given the benefits of gender equality, it is useful to take stock of the progress that has been made and the gender gaps that remain in the educational outcomes of young men and women in Latin America and the Caribbean (LAC). While LAC countries have made notable progress toward closing gender gaps in education over the past two decades, disparities persist in educational attainment, academic performance, career trajectories and labour market outcomes. Shaped by socio-economic factors, cultural expectations and institutional barriers, these gaps have significant consequences for individual opportunities and broader societal progress.

This report examines patterns in gender disparities in education in the LAC region, drawing on data from key international assessments, including the Programme for International Student Assessment (PISA), the

Programme for the International Assessment of Adult Competencies (PIAAC), and the OECD's Education at a Glance (EAG) indicators. It also explores the broader implications of gender inequality in education, considering both economic and social perspectives.

The report is structured as follows: Chapter 2 examines gender disparities in secondary school attainment and early school leaving across Latin America and the Caribbean, identifying regional patterns and differences among countries. Chapter 3 analyses gender gaps in academic performance in upper secondary education, focusing on key subjects such as mathematics, science and reading, using PISA data from LAC countries. Chapter 4 investigates gendered career choices, particularly in STEM fields, and their implications for skills development and employment opportunities in LAC labour markets. Chapter 5 assesses gender differences in skills acquisition among youth and adults, drawing on PIAAC data to examine how these disparities influence labour market participation, wages and broader employment outcomes in the region. Finally, Chapter 6 presents key policy recommendations to address gender gaps in education, skills and the workforce, with a focus on promoting gender equity in STEM fields across Latin America.

Gender disparities in educational attainment and early school leaving

In many LAC countries, girls now outperform boys in educational participation and attainment – a reversal of historical trends. Over the past two decades, female enrolment and completion rates at both secondary and tertiary levels have surpassed those of males, with women more likely to complete upper secondary education and pursue tertiary studies in several countries in the LAC region (UNESCO, 2020; OECD, 2023).

For example, in Argentina, Brazil and Chile, women's tertiary enrolment rates exceed those of men by nearly 20 percentage points (OECD, 2022). Despite these gains for girls and women, early school leaving remains a pressing challenge among boys, particularly for those from disadvantaged socio-economic backgrounds. Family expectations to contribute to household income and disengagement from formal education contribute to higher dropout rates among boys, with an average dropout rate of 20% compared to 15% for girls in the region (UNESCO, 2022).

Gender gaps in educational performance in LAC

Latin America and the Caribbean (LAC) face a significant challenge in ensuring that all students acquire foundational learning skills. Recent data from PISA highlight this. The OECD Programme for International Student Assessment that measures 15-year-old students' performance in reading, mathematics, and science literacy shows that 75% of 15-year-olds in the region fall below basic proficiency in mathematics (Level 2) and 55% are below proficiency in reading. Learning outcomes are especially poor among the most disadvantaged: 88% of the most vulnerable students performed below proficiency in mathematics compared to 55% among the wealthiest (Saavedra and Regalia, 2023). While girls are making notable progress in completing upper secondary education, gender disparities in learning outcomes persist across key subject areas.

PISA assessments over the years have consistently shown that girls outperform boys in reading while boys tend to perform better, on average, in mathematics, though not in all countries. In PISA 2022, this still holds true, with countries in the LAC region reporting some of the widest gender gaps in mathematics scores globally. In Chile, Peru and Costa Rica, boys outperformed girls by 16 points, 15 points and 15 points, respectively, making them part of the seven countries with the widest gender gap in mathematics performance in favour of boys along with Italy, Austria, Albania and Jordan (OECD, 2023). Cultural expectations and girls' lower self-confidence in mathematical ability may contribute to these differences despite evidence that when given equal encouragement and support girls perform just as well as boys (González de San Román and de la Rica, 2012[4]).These disparities highlight structural barriers and societal norms that influence self-perceptions of academic ability and career choices.

In line with global trends, girls performed better than boys in reading in almost all countries in the LAC region. Costa Rica and Chile are the only countries where there was no difference between boys' and girls' performance, and in no country in the region did boys outperform girls. Dominican Republic and Jamaica are the countries in the region with the largest gender gaps in reading, exceeding 25 percentage points in favour of girls. The gender differences in science are the most varied. In Mexico, Costa Rica, Peru, Guatemala, Chile and Argentina, boys outperformed girls while in the Dominican Republic and Jamaica, girls performed significantly better. The remaining six participating countries show no significant gender differences.

This points to the need for targeted strategies that address the overall learning crisis and the gendered dimensions of academic performance.

Factors influencing career choices and gendered pathways in education

Although women's access to higher education has improved overall, this has not translated into equitable conditions across all career paths. Structural gender inequalities – prevalent worldwide – continue to manifest in various forms: occupational segregation, underrepresentation of women in high-productivity and economy-driving sectors such as science, technology, engineering and mathematics (STEM), persistent wage gaps and lower overall participation in the labour market. In this context, the unequal burden of unpaid care work constitutes a critical structural challenge that prevents women's full participation and impedes progress towards their economic autonomy.

The underrepresentation of women in STEM fields, in particular, has been widely documented. While the absolute number of women in these disciplines has increased, their relative participation and opportunities for advancement in comparison to men continue to remain disproportionately low, particularly in engineering, and information and communication technologies (ICTs). This stems from a complex interplay of factors rather than a single root cause.

One key explanation is self-selection bias, where socialisation processes and gender stereotypes influence girls' decisions not to pursue STEM education. Reinforcing the notion that STEM careers are predominantly male, these stereotypes are internalised early in life, shaping girls' interest, confidence and performance in these subjects. Additionally, research suggests that women often struggle to identify with STEM fields as self-efficacy and motivation are shaped by gender norms, the perception of societal beliefs and a lack of role models and support systems (Blackburn, 2017).

Beyond individual motivation, social context plays a crucial role. Factors such as parental education, socio-economic status, traditional parental expectations, peer influence and media representation affect girls' interest and self-perception in STEM. In schools, teachers' skills, pedagogical approaches and gendered expectations can further impact girls' participation and progression in STEM subjects (UNESCO, 2019). Teachers' perceptions of students' abilities based on gender may create unequal classroom environments, discouraging girls from pursuing STEM studies.

Another major barrier is the burden of unpaid domestic and care work, which disproportionately affects female students, particularly those from low-income backgrounds. This responsibility hinders their educational and career pathways, limiting their time for learning, acquiring digital skills or participating in extracurricular learning. These responsibilities become particularly acute during adolescence, a period when gender norms often become more rigid and discriminatory practices more entrenched (Vaca-Trigo & Valenzuela, 2022). The COVID-19 pandemic further exposed and exacerbated these inequalities. Prolonged school closures affected over 160 million young people in Latin America in 2020, disrupting learning and educational continuity (ECLAC/UNESCO, 2020; ECLAC, 2021). Household surveys and other data from 11 Latin American countries compiled by the Inter-American Development Bank (IDB) – representing 83% of the student population aged 6 to 23 in the region – indicate that study hours significantly declined during the pandemic, reducing learning outcomes and increasing dropout risks. For female students, the pandemic increased the burden of unpaid care work, which, in turn, affected their ability to engage in learning (Acevedo et al., 2021[5]). This aggravated an already disparate situation: before the pandemic, girls in Bolivia, Guatemala and Nicaragua spent between three and four hours daily on care work while boys spent less than 2.8 hours. In Ecuador, girls spent 3.8 more hours per week than boys on household chores (ECLAC/UNICEF, 2016; ECLAC et al., 2020). The pandemic deepened pre-existing gender disparities, reinforcing barriers to educational and professional advancement for them.

The COVID-19 crisis serves as a powerful reminder that women are often disproportionately affected during periods of economic or social disruption. This highlights the fragility of existing gains and the need to strengthen systems that bolster women's resilience in education and career advancement.

Gender gaps in skills development and labour market outcomes in LAC

The disadvantages girls face in education do not end with schooling. They compound over time and shape skills development into adulthood. These early gaps are evident in persistent gender disparities in adult competencies, with women often scoring lower in areas such as numeracy and problem solving in digital contexts. In this way, inequalities rooted in the school years lay the groundwork for broader, long-term skill gaps. Data from the OECD's Programme for the International Assessment of Adult Competencies (PIAAC), a survey that assesses the skills of 16–65-year-old adults in participating countries, reveals significant differences between men and women in foundational skills such as literacy, numeracy, problem solving in technology-rich environments and job-related competencies that influence labour market outcomes. The first cycle of the PIAAC survey was conducted over three rounds in different years between 2011 and 2017. Four Latin American countries took part in the PIAAC survey: Chile, Ecuador, Mexico and Peru. Chile participated in the second round (2014–2015) while Ecuador, Mexico and Peru joined in the third round (2017).

In these Latin American countries participating in PIAAC, gender disparities in literacy tend to be smaller than those observed in numeracy, reflecting global trends. There is little difference between men and women in reading proficiency, with 59.3% of men and 60.1% of women scoring below Level 2. This pattern is consistent with OECD averages, where 17.6% of men and 17.7% of women fall below Level 2. However, overall literacy levels in the region remain well below the OECD average (OECD, 2023). In numeracy, much smaller proportions of the adult population in the LAC participating countries performed at Level 3 or above compared to the OECD average, with only 4-12% of adults in Latin America reaching this level versus 42% in the OECD. The gender gap in numeracy also exceeds the OECD average of 11 score points, reaching 16 points in Peru and 21 points in Chile. These gaps are particularly wide among older adults where differences in educational attainment and occupational choices have particularly long-term consequences for skills development and retention. Among adults aged 25 and over, men perform significantly better than women in numeracy, with the gap rising to 19 points in Peru and 24 points in Chile – the highest among PIAAC-participating countries. In contrast, among younger adults (aged 24 and under), these gaps shrink to 5 and 8 points, respectively, falling below the OECD average. One explanation for this is that young women participate in education and skills development at a far higher rate than their older peers did at similar ages. As women's educational attainment has caught up with men's, skill disparities have narrowed among younger generations (OECD, 2019). This suggests that gender differences in skills development may continue to lessen over time, reflecting the broader progress in women's educational attainment and participation.

Beyond literacy and numeracy, gender gaps in problem-solving skills are less pronounced though men tend to have a slight advantage. On average, across OECD countries, 32% of men scored at Level 2 or 3 in problem solving in digital environments compared to 28% of women. In Ecuador and Peru, 6% and 7% of men, respectively, reached these levels compared to 4% and 6% of women (OECD, 2019). The gap is wider in Mexico (13% of men versus 8% of women) and Chile (17% of men versus 12% of women). A larger share of women also reported having no computer experience or failing the information and communication technologies (ICT) core test compared to men. In Ecuador, 35% of women fall into this category compared to 31% of men. In Peru, the figures rise to 47% of women compared to 41% of men (OECD, 2019).

These disparities in cognitive and technological skills contribute to broader labour market inequalities. Women in Latin America and the Caribbean remain overrepresented in lower-paying sectors such as education, healthcare and informal employment while men dominate higher-paying fields like engineering and information technology. Occupational data highlight stark gender imbalances: 70.2% of science and engineering professionals are men whereas 71.4% of health professionals and 62.5% of teaching professionals are women (OECD, 2023). Gender gaps in employer-sponsored training and lifelong learning further reinforce these inequalities, limiting women’s career advancement opportunities. Addressing these skill disparities through targeted education, training and workforce development programmes is essential to fostering women’s economic inclusion and creating more equitable labour markets across the region.

Conclusion

Latin America and the Caribbean has made substantial progress in closing gender gaps in school enrolment and basic reading proficiency. In fact, data from the PISA assessment show girls performing at par with or much better than boys in reading performance though in most LAC countries the advantage of girls in reading is much less than in OECD countries. Data from PISA serve to disentangle some of the factors that may be associated with girls’ better performance, including enjoyment of studying and reading. However, despite progress in narrowing gender disparities in educational attainment and reading performance, gaps remain in mathematics and science achievement, career choices, adult skills development and subsequent labour market outcomes.

Girls’ relative skills advantage at age 15 and their self-reported high expectations about their education and labour market aspirations are not reflected in labour market outcomes. Although data from the OECD’s PIAAC survey show that an equally large proportion of adult men and women are not able to meet basic literacy skill standards, women fare relatively worse in the labour market, particularly in earnings, in nearly all countries and at all levels. Young women undergo an educational and occupational sorting process that steers them toward lower-paying sectors and occupations. This is driven by a complex interplay of economic, social, cultural and informational factors, which hinder their ability to fulfil their professional aspirations.

Addressing these challenges requires targeted programmes to support young women in making educational choices and transitioning into the workforce, especially those from disadvantaged backgrounds. While sustaining progress in girls’ and young women’s skills is essential, it alone is not enough to improve labour market outcomes. A multi-pronged approach is needed, integrating gender-sensitive curricula, expanding women's participation in STEM and addressing socio-economic barriers that hinder educational and employment opportunities for girls and women. By ensuring equitable access to quality education and careers, and fostering inclusive labour markets, governments can harness gender equality as a driver of economic growth, social mobility and long-term development in the region.

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2 Attainment of Secondary Education and Early School Leaving

This chapter addresses secondary education attainment and early school leaving, highlighting the importance of completing upper secondary education for labour market entry and employability. Adults without this education level face higher unemployment and lower wages. In Latin America and the Caribbean (LAC), enrolment rates have improved, especially in primary education, but challenges in secondary education persist, resulting in low completion rates. Though progress has been made, the proportion of young adults without upper secondary degrees in the region remains higher than in OECD countries. The chapter also notes that females in LAC have higher completion rates than males.

Introduction

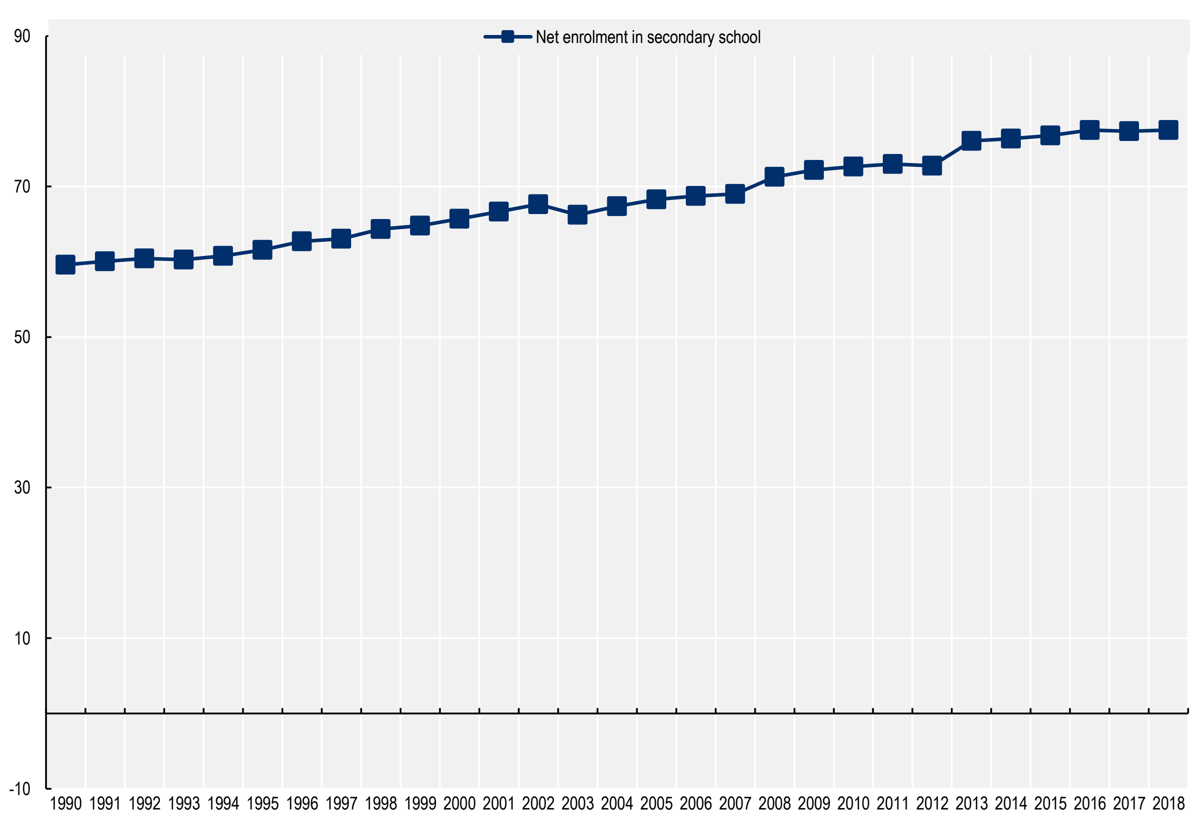
Completing upper secondary education contributes to successful entry into the labour market and continued employability. In OECD countries, adults who have not completed this level of education have the highest unemployment and inactivity rates, and lower wages over their working lives, in particular, during the years before retirement. A large population of low-qualified workers may lead to significant public expenditure on social security and deepening inequalities that are both difficult and costly to address once people have left education (OECD, 2017[1]).

This chapter examines key indicators across the education lifecycle in LAC, including enrolment (access), retention and grade completion. While enrolment rates have improved, particularly at the primary level, challenges remain in ensuring students stay in school and successfully complete their education. Dropout rates and disparities in attainment continue to highlight gaps in educational equity and quality.

Trends in primary and secondary educational attainment in LAC

In the last two decades, Latin America and the Caribbean have seen two of its biggest educational successes: one, gender parity in enrolment in primary school, with average net enrolment rates of 97% percent for both girls and boys in 2019; two, a significant increase in the overall net enrolment in secondary education, rising from 60% in 1990 to 78% in 2018 (Figure 2.1) (World Bank, 2023[2]; Arias Ortiz et al., 2023[3]).

Figure 2.1. Trends in net secondary school enrolment in Latin America & the Caribbean



Source: World Bank Indicators; UNESCO Institute for Statistics (UIS)

In terms of primary education, Latin America and the Caribbean have nearly universal participation (97%), similar to that of the OECD average (99%). But while enrolment rates in secondary education across LAC countries have improved since 1990, significant challenges in access still persist – the average enrolment rate in Latin America and the Caribbean is 79%, 14 percentage points below the average for OECD countries (93%) (Arias Ortiz et al., 2023[3]).

A low net secondary education enrolment rate in Latin America and the Caribbean could partially explain the low completion percentage at that level. The secondary education completion rate – defined as the percentage of students in a given age group who has successfully finished lower or upper secondary education – is notably lower compared to primary. The average for the LAC region is 65.7%, with Chile, Peru and Bolivia having the highest percentage, and Guatemala, Honduras and Uruguay having the lowest. In other words, over a third of the region's population does not complete this level (Arias Ortiz et al., 2023[3]). While the completion rate in Latin America and the Caribbean is higher than the global average (equivalent to 53.2%), it lags behind the OECD average (80%) by 15 percentage points (Arias Ortiz et al., 2023[3]).

Disaggregating this data by country provides deeper insight into the variation across the region and highlights where progress has been made. Costa Rica and Mexico (along with Portugal and Türkiye) were among the countries in the *Education at a Glance* (EAG) database (see Box 2.1) with the biggest jumps in the share of young adults completing upper secondary education, with at least 10 percentage points more 25–34-year-olds attaining their secondary education degree between 2016 and 2023 (OECD, 2024[4]). In 2016, the share of young adults (25–34) without an upper secondary degree was 50% in Costa Rica and 53% in Mexico. By 2023, this had declined to 38% and 42%, respectively, with similar reductions in Colombia, Brazil and Peru (OECD, 2024[4]). This reflects the impact of inclusive public policies focused on reducing early school leaving, such as compulsory schooling and second-chance education programmes. Nonetheless, there is more work to be done. Among the five LAC countries for which data on completion rates are available in EAG, the proportion of young adults without an upper secondary qualification remains considerably higher than the OECD average of 14% in 2023 (Figure 2.2).

Box 2.1. Overview of Education at a Glance (EAG)

The Organisation for Economic Co-operation and Development's Education at a Glance (EAG) offers a rich, comparable and up-to-date array of indicators that reflect a consensus among professionals on how to measure the current state of education internationally. The indicators provide information on the human and financial resources invested in education, how education and learning systems operate and evolve, and the returns to investments in education.

EAG data are compiled by the OECD Indicators of Education Systems (INES) programme, which seeks to gauge the performance of national education systems as a whole, rather than to compare individual institutional or other subnational entities

Indicator groups

- *Indicators on the output, outcomes and impact of education systems:* Output indicators analyse the characteristics of those exiting the system, such as their educational attainment. Outcome indicators examine the direct effects of the output of education systems, such as the employment and earning benefits of pursuing higher education. Impact indicators analyse the long-term indirect effects of the outcomes, such as the knowledge and skills acquired, contributions to economic growth and societal well-being, and social cohesion and equity.
- *Indicators on the participation and progression within education entities:* These indicators assess the likelihood of students accessing, enrolling in and completing different levels of education, as well as the various pathways followed between types of programmes and across education levels.
- *Indicators on the input into education systems or the learning environment:* These indicators provide information on the policy levers that shape the participation, progression, outputs and outcomes at each level. Such policy levers relate to the resources invested in education, including financial, human (such as teachers and other school staff) or physical resources (such as buildings and infrastructure). They also relate to policy choices regarding the instructional setting of classrooms, pedagogical content and delivery of the curriculum. Finally, they analyse the organisation of schools and education systems, including governance, autonomy and specific policies to regulate the participation of students in certain programmes.

Statistical coverage

Although a lack of data still limits the scope of the indicators in many countries, the coverage extends, in principle, to the entire national education system (within the national territory), regardless of who owns or sponsors the institutions concerned and regardless of how education is delivered. In general, all types of students and all age groups are included: children (including students with special needs), adults, nationals, foreigners and students in distance learning, in special education programmes or in education programmes organised by ministries other than the ministry of education, provided that the main aim of the programme is to broaden or deepen an individual's knowledge.

Country coverage

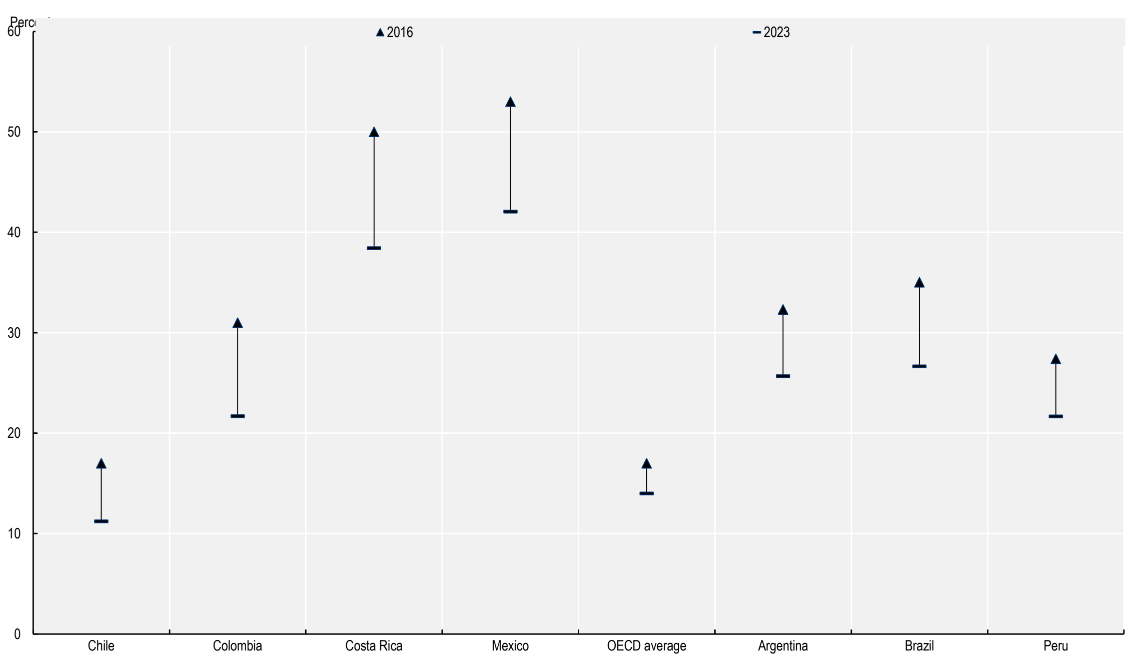
This publication features data on education from all OECD countries and Brazil, a partner country that participates in the INES programme, as well as other G20 and OECD accession countries that are not INES members (Argentina, Bulgaria, Croatia, the People's Republic of China, India, Indonesia, Peru, Romania, Saudi Arabia and South Africa). Data sources for the non-INES participating countries come from the regular INES data collections or from other international or national sources.

Source: OECD (2023)

Improvements in completion rates are closely tied to broader trends in student progression and grade repetition within the education system. One key factor influencing completion is the rate at which students repeat grades. Over the last decade, the repetition rate in Latin American and Caribbean countries has decreased, which has also led to improvements in completion rates. For example, in the case of primary education, the repetition rate decreased by an average of 1.7 percentage points (from 5.5% in 2010 to 3.8% in 2018) although it is still higher than the OECD average of 1.3% in 2018 (Arias Ortiz et al., 2023[3]). The lower secondary repetition rate is going down as well though it is still higher than in primary education in both OECD and LAC countries.

Continuing a previously observed downward trend (OECD, 2020[5]), the share of 15-year-old students who had repeated a grade continued to fall between 2018 and 2022. While about 11% of students had repeated a grade at least once in 2018 across OECD countries, this figure dropped to 9% in 2022 – an overall decline of nearly 2 percentage points. Some of the largest drops in grade repetition – of at least 6 percentage points – were observed in many LAC countries, including Argentina, Brazil, Chile, Costa Rica, the Dominican Republic, Guatemala, Mexico, Panama, Peru and Uruguay. In contrast, the grade repetition rate in Colombia remained high, at nearly 40% (OECD, 2023[6]).

Figure 2.2. Trends in the percentage share of 25–34-years-old with below upper secondary attainment (2016 and 2023)



Source: OECD, EAG 2024 Database

Despite these positive trends, some countries in the region still have large proportions of young adults without upper secondary attainment. The highest shares are in Costa Rica where 41% of men aged 25–34 years and 36% of women in the same age group have below upper secondary attainment, and Mexico where the shares are 42% for both young men and women. In Argentina, 40% of secondary-school students (both male and female) leave school without a qualification.

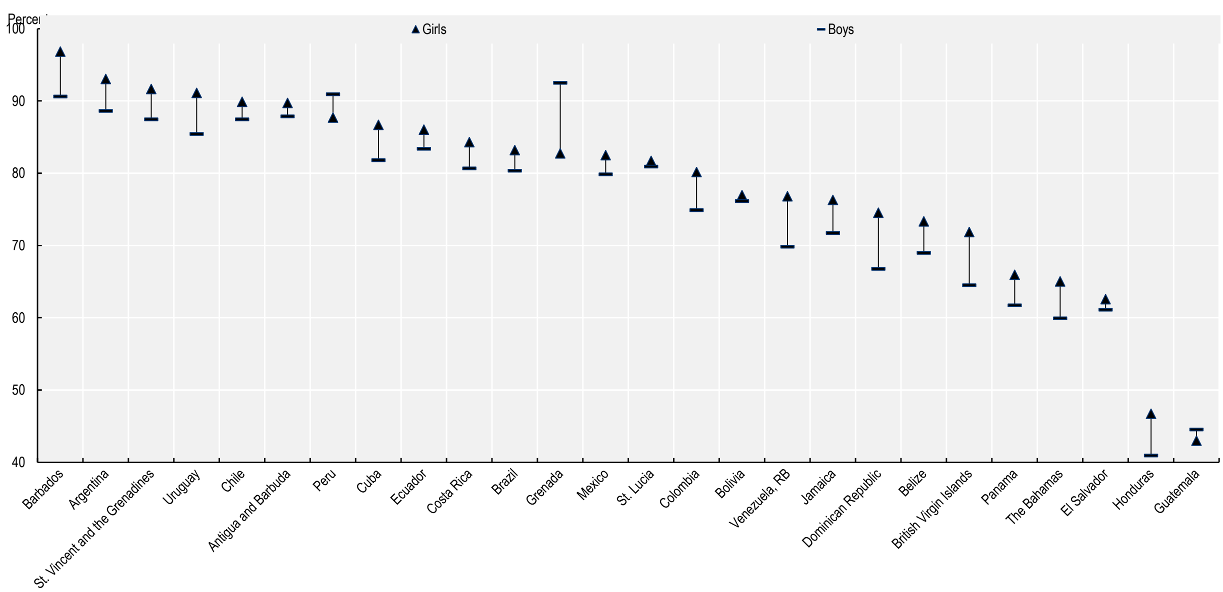
Adults without upper secondary attainment face severe challenges in the labour market, reflected in higher unemployment rates and lower wages on average compared to adults with higher levels of attainment (OECD, 2024[4]). As the educational landscape changes, there may be a need to focus on lifelong learning and continuing education to ensure that all individuals can continue to adapt to rapidly changing job markets.

Gender differences in enrolment and school retention at the secondary level

Not only does secondary school enrolment still need to improve, but the gap in most LAC countries has also tended against boys (78% for girls and 76% for boys in 2019 (Figure 2.3) (World Bank., 2021[7]). In many LAC countries, boys also have lower rates of completion of secondary education than girls, starting at the lower secondary level (World Bank., 2021[7]). Upper secondary school completion among girls in Latin America and the Caribbean is 68.7% on average as compared to 61.5% for boys – a difference of almost 7 percentage points (Arias Ortiz et al., 2023[3]).

Figure 2.3. Boys' secondary school enrolment is lower than girls' in most LAC countries

Net secondary enrolment (2017-2019, latest data)



Source: World Bank Indicators; UNESCO Institute for Statistics (UIS)

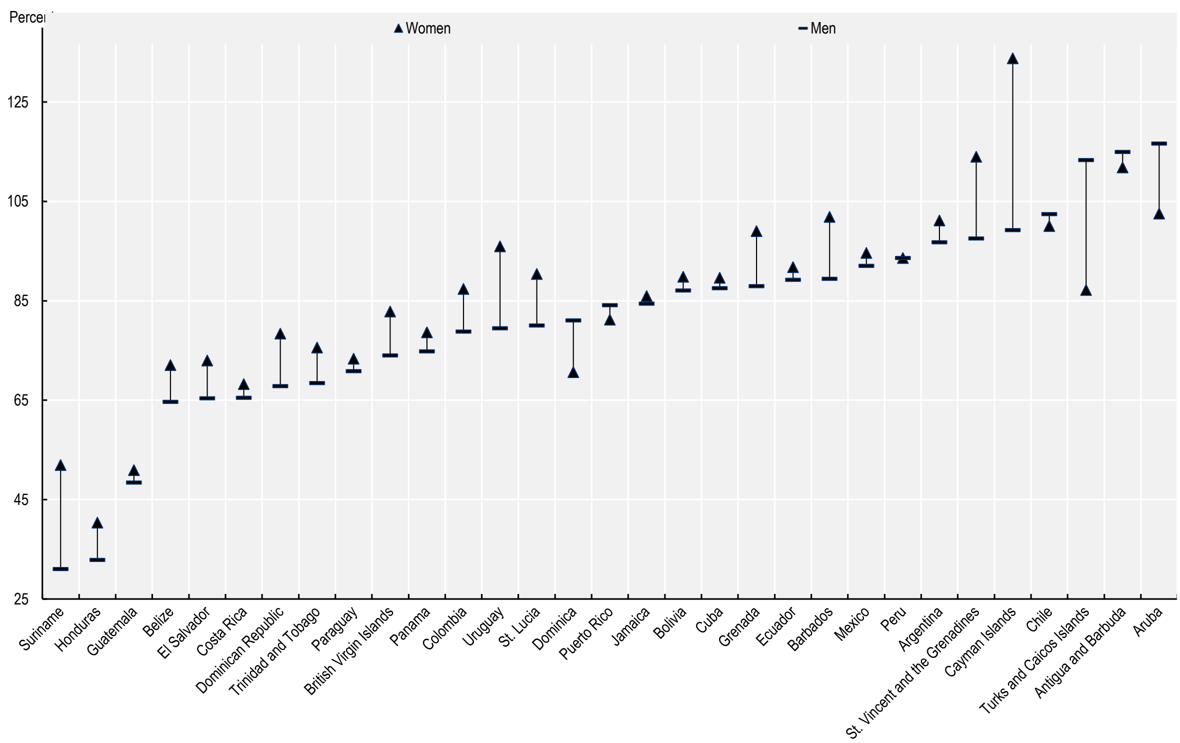
In Latin America and the Caribbean, high rates of early school dropout also persist: 19% of young people aged 18 to 24 do not attend any level of education and have not completed secondary education (Arias Ortiz et al., 2023[3]). This is especially the case for boys in the region, with a "reverse gender gap" in enrolment and completion predominant in the region: compared to girls and young women, boys and young men are at a higher risk of dropping out of secondary and tertiary education.

This is despite the fact that grade repetition, though a declining practice, is more common among 15-year-old boys than girls surveyed as part of PISA 2022 (OECD, 2023[6]). Among the 81 countries that took part in PISA 2022, 69 countries had more boys than girls who had repeated a grade in either primary or secondary school, with all LAC countries falling in this category. Grade repetition is meant to give students a "second chance" at improving their scores and mastering the knowledge and skills appropriate for their grade level (OECD, 2023[6]). Previous research, however, has found mostly negative effects of grade repetition on student outcomes. Students who have repeated a grade tend to perform less well in school and hold more negative attitudes towards school at age 15 than students who have not repeated a grade in primary or in secondary education; they are also more likely to drop out of high school (Ikeda, M; García, E., 2014[8]; Manacorda, M., 2012[9]). In addition, grade repetition can be a costly policy as it generally requires greater expenditure on education and delays students' entry into the labour market (Education Endowment Foundation., 2023[10]).

As a result, one of the greatest gender-related challenges in the LAC region has become the generally low attendance, progression and completion rates of boys in secondary and tertiary levels. In most LAC countries, boys' lower secondary school completion is below that of girls (Figure 2.4).

Figure 2.4. Boys' lower secondary school completion is lower than girls' in most LAC countries

Lower secondary completion rate, male/female (% of relevant age group), latest data 2019-2023



Note: Numbers represent latest data point in the period 2019-2020. The indicator is calculated as the number of new entrants in the last grade of lower secondary education, regardless of age, divided by the population at the entrance age for the last grade of lower secondary education. A number higher than 100 reflects late entrants and overage students.
Source: World Bank Indicators; UNESCO Institute for Statistics (UIS)

High rates of school dropout among adolescents carry significant consequences. Early exit from education limits the skills of new generations entering the workforce. It reduces current productivity and weakens a country's ability to navigate later stages of the demographic transition when dependency ratios increase. Adolescents who are out of school are more exposed to risks such as teenage pregnancy, substance abuse, violence and crime – challenges that are harder to address outside structured environments. Furthermore, during adolescence an individual's personality aspects (including planning capacity, organisational skills and decision-making capabilities, among others) are still developing, exiting the school environment prematurely can hinder their development (Kattan and Székely, 2015[11]).

Dropout rates at the upper secondary education level in Latin America and the Caribbean can be attributed to a combination of structural, economic and labour market factors. One of the main drivers is the increasing demographic pressure on upper secondary school systems. This is due in part to more students – particularly from lower-income backgrounds – completing lower secondary education and becoming eligible for upper secondary schooling. While this expansion represents progress in access, it has also led to a higher proportion of vulnerable students entering education systems that are often underprepared to address their specific needs. These students, who have often faced unfavourable socio-economic conditions throughout their lives, may encounter environments in upper secondary education that are not adequately equipped to support them, leading to higher dropout rates. Without sufficient teacher training, psychosocial support and inclusive pedagogical strategies, schools may unintentionally push these students out of the system (Kattan and Székely, 2015[11]).

A second set of factors relates to the broader economic context. Although GDP growth rates across the region have not shown a strong statistical relationship with changes in dropout rates, the sharp decline in inflation over the past two decades has been consistently associated with improved student retention. This suggests that macroeconomic stability plays a crucial role in enabling households to make sustained investments in education. Nonetheless, the benefits of this stability have been offset by the simultaneous influx of students from more disadvantaged backgrounds, which has compounded the pressures on schools. In this context, if macroeconomic conditions had not improved, dropout rates could have been even higher, underscoring the importance of a stable economic environment for education outcomes (Kattan and Székely, 2015[11]).

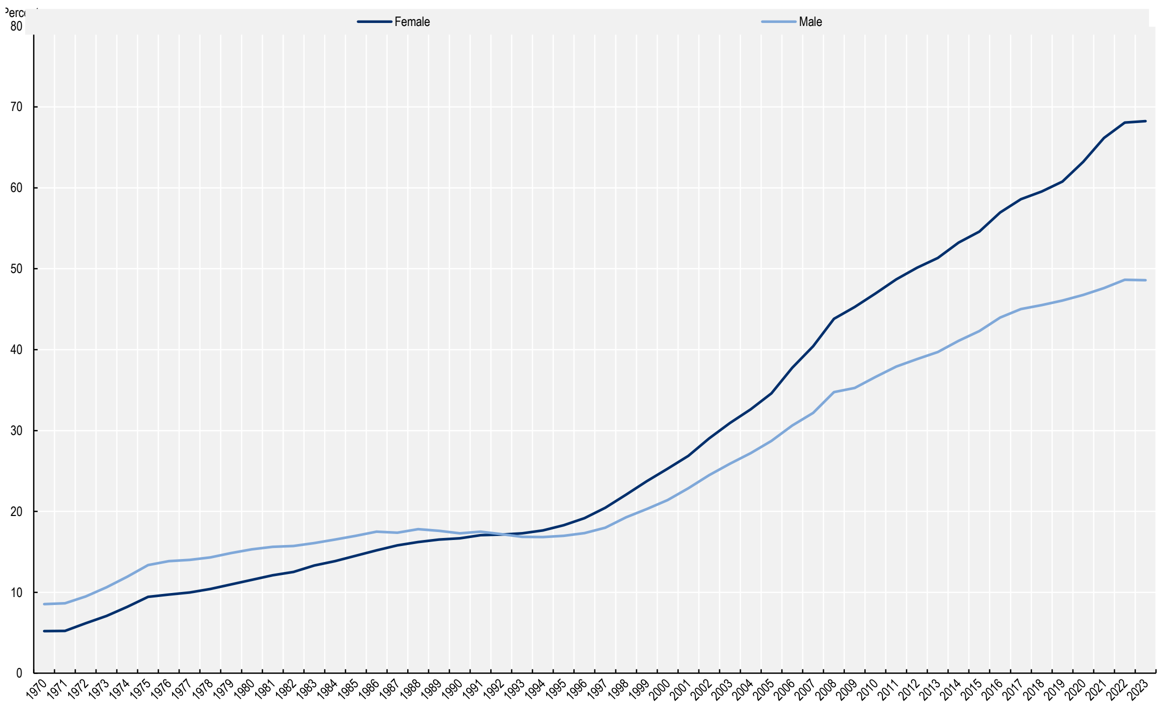
Labour market conditions also influence dropout patterns. In general, when household incomes increase, families are more likely to invest in their children's education, reinforcing the idea that most families prioritise schooling when they can afford to do so. However, when wages and employment opportunities for adolescents rise – especially in low-income countries – these can act as a pull factor drawing youth out of school and into the labour market. This substitution effect, where immediate income gains are prioritised over longer-term educational investments, appears particularly strong in countries with the highest early dropout rates, where families face more urgent financial constraints. The effect is especially pronounced among boys, who tend to respond more strongly to labour market opportunities than girls, likely reflecting prevailing gender norms and expectations about income generation and family support (Kattan and Székely, 2015[11]).

Trends in gender gaps in tertiary education enrolment

With the share of young adults (aged 25–34) without an upper secondary education degree having declined in several LAC countries by around 10 percentage points (see section above), tertiary education enrolment has also increased. However, these gains are not evenly distributed. Today, more than 60% of women in Latin America and the Caribbean are enrolled in higher education compared to fewer than 50% of men (Figure 2.5).This marks a significant shift from 1970 when only 5% of women in the region progressed beyond secondary school (Willige, 2023[12])

Figure 2.5. In Latin America and the Caribbean, women are now more educated than men

Tertiary school enrolment in Latin America and the Caribbean (ratio of total enrolment of eligible men vs women)



Source: UNESCO Institute for Statistics (UIS).

Latin America and the Caribbean ranks second globally in gender parity in higher education, following Oceania (which includes Australia and New Zealand as well as 12 other countries), according to UNESCO. The region's gender gap in tertiary education began reversing as early as 1993 – just one year after this trend emerged among countries in the European Union and eight years before this trend emerged worldwide. Panama was the first country in the region to achieve gender parity in tertiary education in 1973, followed by Uruguay in 1979, Argentina in 1989, and Mexico in 2016 (Willige, 2023[12]).

The World Economic Forum's Global Gender Gap Report 2022 noted high levels of gender parity in education in Latin America and the Caribbean, with 18 countries having closed their gender gap in tertiary education (WEF, 2022[13]). However, it also pointed out that other countries in the region, including El Salvador, Honduras and Guatemala, have low enrolment rates for both sexes compared to some of their neighbours. This progress in most LAC countries, however, is significant, as higher levels of female education are linked to reduced economic inequality and the advancement of sustainable development.

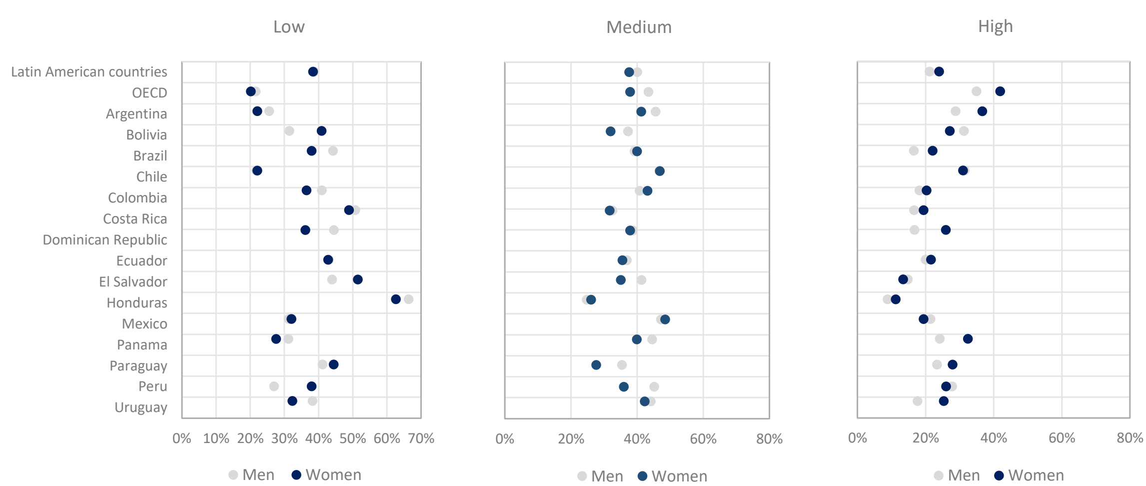
Continued growth in women's university enrolment is essential, but equally important is ensuring that labour markets are receptive to their skills and adaptable to their needs. The region has made remarkable strides over the past 50 years – building on this momentum will be crucial for the decades ahead.

Overall educational attainment trends

Another clear indicator of progress is the rise in the average years of schooling among adults aged 25 to 65. Based on data from the Socio-Economic Database for Latin America and the Caribbean (SEDLAC), average years of schooling increased from 7 years in 1990 to 9.5 years by 2020. This progress has led to a decline in the share of low-educated adults (those with nine years of education or fewer) and an increase in medium-educated (9-13 years) and high-educated adults (more than 13 years). However, Latin American countries still have a larger share of low-educated adults, and a smaller share of medium- and high-educated adults compared to OECD countries.

In most Latin American countries, educational attainment levels are similar for men and women. As of 2019, 38.8% of men and 38.4% of women were classified as low-educated, while 40.0% of men and 37.6% of women were medium-educated. The proportion of low-educated women varies across countries, ranging from 30% or less in Argentina, Chile and Panama to over 50% in El Salvador and Honduras (Figure 2.6). Although women in the region tend to have higher educational attainment than men, their share of highly educated adults remains below the OECD average. For example, 36.7% of working-age women in Argentina, 32.4% in Panama and 31.0% in Chile have more than 13 years of education compared to 42% in OECD countries (OECD, 2023[6]).

Figure 2.6. Distribution of education levels among 25–65-year-olds, by gender



Note: The figure displays percentages. The most recent data available on average years of education were used. Low-educated adults are those who attained less than nine years of education. Medium-educated adults are those who attained between nine and 13 years of education. High-educated adults are those who attained more than 13 years of education.
Source: Authors' calculations using SEDLAC and OECD data

Conclusion

Despite significant progress in enrolment and gender parity at the primary and secondary levels, Latin America and the Caribbean continue to face persistent challenges in ensuring that students – particularly boys – remain in school and complete upper secondary education. Completion of this level is increasingly vital for labour market success and early school leaving limits both individual opportunities and broader economic development.

While several countries in the region have made noteworthy gains in secondary completion rates and reductions in grade repetition, a sizeable proportion of youth still exit the education system prematurely. The reasons are complex and multi-faceted, ranging from structural barriers in the education system to economic pressures and socio-cultural expectations. Boys are disproportionately affected, with higher rates of grade repetition, lower progression through school, and a greater a likelihood of leaving education early, often driven by pressure to enter the labour force early and gendered norms that undervalue their academic engagement. In contexts where wages or job availability for adolescents improve, school-aged youth – particularly boys – may leave school in pursuit of short-term earnings. This substitution effect is strongest in countries with high early dropout rates and more pressing household financial needs. Cultural expectations around boys' economic responsibilities may further accelerate their early exit from school as families prioritise immediate income over continued education.

Encouragingly, improvements in secondary attainment have coincided with rising tertiary enrolment, especially among women. This reflects a broader transformation in educational access and aspirations across the region. However, narrowing gender gaps in attainment must go hand in hand with strategies to support those most at risk of dropping out. Reducing early school leaving and ensuring that all young people can benefit from quality secondary education will be critical for building a more equitable and prosperous future in Latin America and the Caribbean.

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3 Gender differences in academic outcomes of 15-year-old students: Results from PISA 2022 in Latin America and the Caribbean

This chapter examines gender differences in performance in PISA in Latin America and the Caribbean (LAC) using data from the 2022 PISA assessment. The participation of 14 countries, including first-time participants, El Salvador, Guatemala, Jamaica and Paraguay, provided insights into 15-year-old students' knowledge and skills post-COVID-19. The findings revealed a significant decline in performance on average, with LAC countries experiencing the longest school closures and poor outcomes. Boys outperformed girls in mathematics on average, but the gender gap was smaller compared to OECD countries. Notably, in Jamaica and the Dominican Republic, girls outperformed boys in mathematics. Conversely, Chile, Peru, and Costa Rica exhibited large gender gaps favouring boys. These results underscore the need for equitable education systems in LAC countries.

Introduction

In 2022, 14 countries from the Latin American and Caribbean (LAC) region participated in the Programme for International Student Assessment (PISA) (see Box 3.1 below for full list of LAC countries that participated). First-time participants from the region included El Salvador, Guatemala, Jamaica and Paraguay, although Guatemala and Paraguay were a part of the PISA for Development initiative previously (OECD, 2023[1]). The increased LAC participation, with four more countries joining since PISA 2018, provides a richer assessment of 15-year-olds' knowledge and skills overall and regionally.

Box 3.1. Overview of PISA

The Programme for International Student Assessment (PISA) is an international comparative study of 15-year-old students' performance in reading, mathematics, and science literacy co-ordinated by the Organisation for Economic Co-operation and Development (OECD). The PISA 2022 results represent outcomes from the eighth cycle of PISA since the study's inception in 2000. PISA has been conducted every three years except for a one-year delay in the current cycle (from 2021 to 2022) due to the pandemic.

The main domain of the study rotates among mathematics, science and reading in each cycle. PISA also offers optional domains such as financial literacy and includes measures of general or cross-curricular competencies, such as collaborative problem solving. By design, PISA emphasises functional skills that students have acquired as they near the end of compulsory schooling.

Eighty-one countries and economies participated in the 2022 assessment, which focused on mathematics. The OECD released the data on 5 December 2023. A total of 14 countries from the Latin American and Caribbean (LAC) region participated in the PISA 2022 cycle: Argentina, Brazil, Colombia, Costa Rica, Chile, Dominican Republic, El Salvador, Guatemala, Jamaica, Mexico, Panama, Paraguay, Peru, and Uruguay.

The ninth cycle of the assessment, PISA 2025, is currently underway. The results will be published in 2026.

Source: (OECD, 2023[1])

Box 3.2. Interpreting PISA scores and proficiency levels

Unlike physical units that have a substantive and universal meaning, PISA scores are established based on the range of results observed across all participants in each assessment. Results are standardised to approximate a normal distribution, meaning there are no strict theoretical minimums or maximums. As a result of the standardisation, the average score is around 500 points, with a standard deviation of approximately 100.

Proficiency levels

The score scale is categorised into proficiency levels of which there are 8 in PISA 2022. An individual at a particular proficiency level can generally handle items at that level and below but struggles with higher-level tasks. Each mathematics proficiency level spans approximately 62 score points while reading and science proficiency levels differ by about 73 and 75 score points, respectively. Differences of these magnitudes indicate different levels of skills and knowledge.

More importantly, Level 2 is considered the minimum proficiency level across reading, mathematics and science. In mathematics, students accomplish high levels of proficiency if they understand mathematical problems and can formulate models to solve them whereas reading proficiency is defined as "(…) understanding, using, evaluating, reflecting on, and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society". Finally, proficiency in science is the capability of engaging with the discipline as a reflective citizen.

Score differences

Differences of smaller magnitudes may or may not reflect variations in terms of skills and knowledge. To compare these smaller differences, their statistical significance must be assessed because PISA results are estimates derived from samples. This is why interpreting results across different assessment years must be done using "link errors" as the same score may not represent the same skills and knowledge across assessments.

Source: Box 1, (OECD, 2023[1]).

PISA 2022 is an extremely crucial assessment not only because it followed school closures around the world during the COVID-19 pandemic, but also because it reveals a learning crisis. PISA 2022 shows a significant decline in the performance of OECD countries in mathematics and reading, with scores dropping by 15 points and 10 points, respectively, while science scores remained stable. Historically, the OECD average had fluctuated by no more than four points in mathematics and five points in reading between consecutive assessments, making these declines unprecedented. This drop suggests the widespread negative impact of school closures; however, it cannot be solely attributed to the pandemic as declines in reading and science performance had been observed prior to it (OECD, 2023[1]).

Latin America and the Caribbean, with the longest school closures in the world – averaging 70 weeks (29 weeks longer than the world average of 41 weeks) – experienced particularly poor outcomes, reflected in generalised low performance and a lack of proficiency among students across different domains compared to the OECD average (ECLAC, 2022[2]). It also highlighted the need for more equitable education systems in LAC countries (OECD, 2023[1]). From a gender perspective, the findings are especially interesting. LAC and OECD countries are, on average, similar in that boys outperformed girls in mathematics in most countries while girls performed better than boys in reading in almost all countries. However, the gender gap in performance is slightly smaller in LAC countries in both reading and mathematics on average. On the other hand, in science, LAC countries saw boys outperform girls while in OECD countries, there is no gender gap in science.

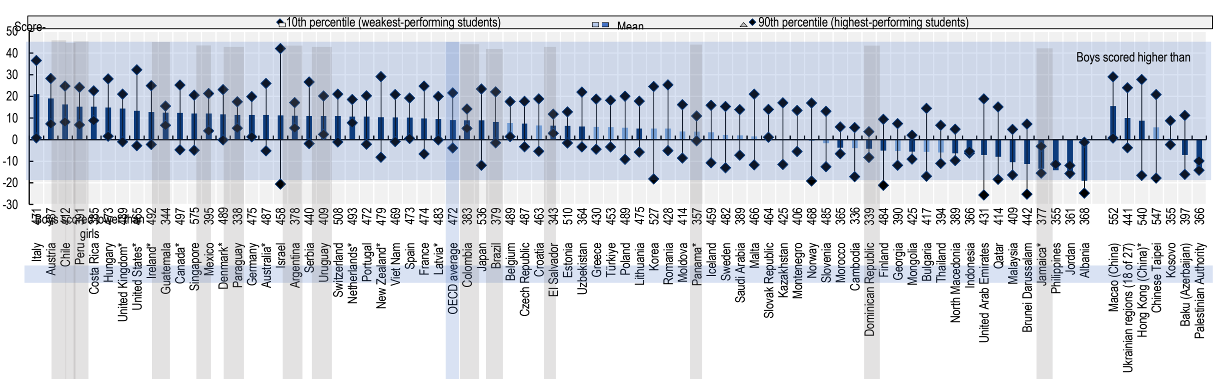
Performance of LAC boys and girls in mathematics in PISA 2022

In PISA 2022, all participating LAC countries recorded mean scores in mathematics below the OECD average of 472 points. However, the gender gap in performance is slightly smaller among the LAC countries, on average, compared to the OECD. Across the participating LAC countries, boys outperformed girls in mathematics by 8 score points while in the OECD, boys outperformed girls by 9 score points. Eight out of the fourteen LAC countries recorded a larger gender gap than the OECD average (OECD, 2023[1]).

In contrast, in Jamaica and the Dominican Republic in the LAC region, girls outperformed boys in mathematics by 13 and 4 score points, respectively. Jamaica and the Dominican Republic are two of only 17 countries among all PISA-participating countries where girls performed better than boys in mathematics (OECD, 2023[1]). On the other hand, in Chile, Peru and Costa Rica, boys outperformed girls by 16 points, 15 points and 15 points, respectively, making them part of the seven countries with the widest gender gap in mathematics performance in favour of boys along with Italy, Austria, Albania and Jordan. Only in Panama is the difference in mathematics performance between girls and boys not statistically significant (Figure 3.1) (OECD, 2023[1])

Figure 3.1. Gender gap in mathematics performance, PISA 2022

Score-point difference in mathematics between boys and girls.



Note: Statistically significant differences at 5% are displayed in a darker tone
Source: OECD, PISA 2022 Database, Tables I.B1.2.1 and I.B1.4.17

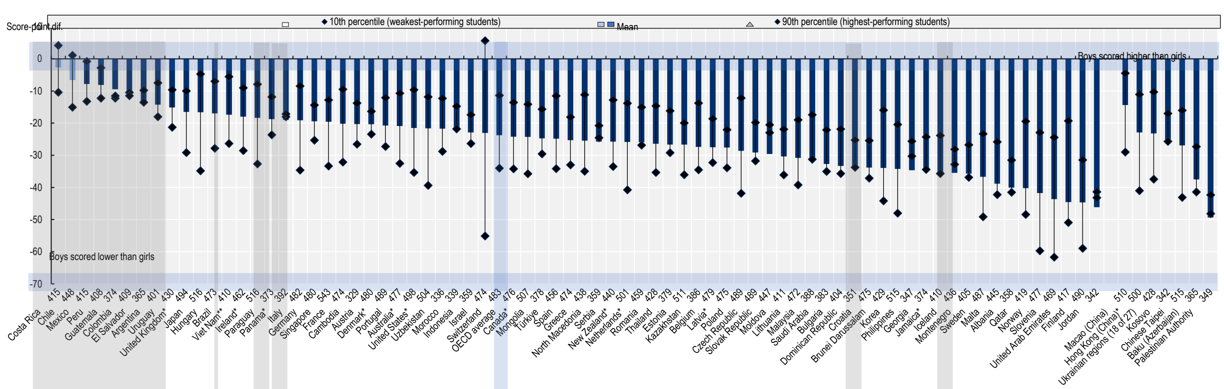
Performance of LAC boys and girls in reading in PISA 2022

In reading, girls outperformed boys on average in both the LAC region and OECD countries, with a wider gap than the one between boys and girls in mathematics in favour of boys. In almost all PISA-participating countries, girls performed better than boys in reading. The exceptions were two OECD LAC countries – Costa Rica and Chile – where the difference in performance between boys and girls is not statistically significant (OECD, 2023[1]). Similar to the gender gap in mathematics, the gender gap in reading – this time in favour of girls – is larger among OECD countries (24 points) than among the LAC countries (15 points). This suggests that girls in LAC countries do not have the same advantage in reading compared to the OECD average for girls.

In Jamaica and the Dominican Republic, girls outperformed boys by a larger margin than the OECD average (24 points), with differences of 35 and 34 score points, respectively (OECD, 2023[1]). Interestingly, 9 out of the 10 countries with the narrowest gender gap in reading performance are LAC countries – ranging from Costa Rica (3 score points, not statistically significant) to Uruguay (15 score points). The average gender gap across LAC countries (15 points) also falls in this range (Figure 3.2).

Figure 3.2. Gender gap in reading performance, PISA 2022

Score-point difference in reading between boys and girls.



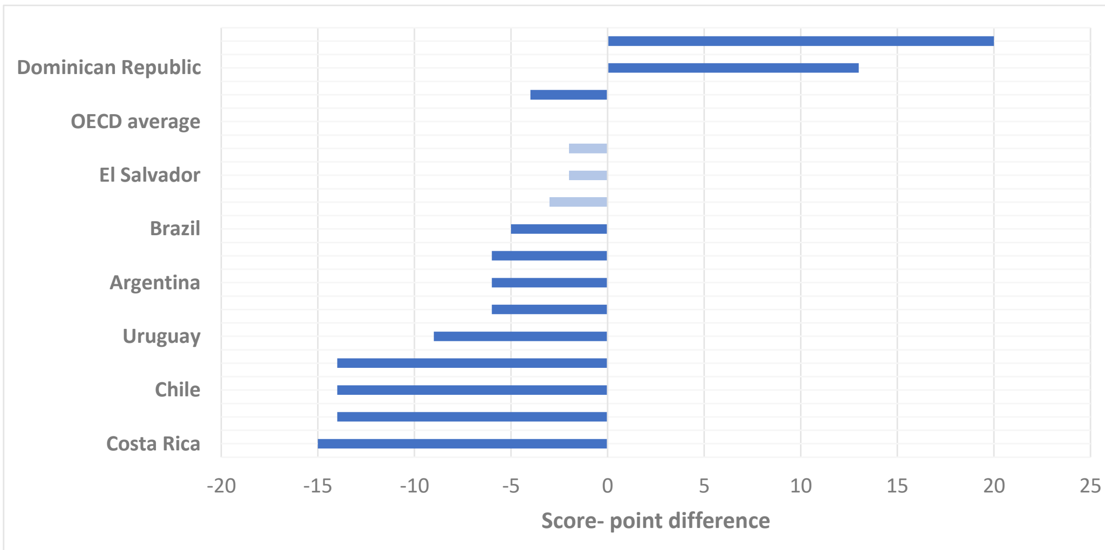
Note: Statistically significant differences at 5% are displayed in a darker tone
Source: OECD, PISA 2022 Database, Tables I.B1.2.2 and I.B1.4.18

Performance of LAC boys and girls in science in PISA 2022

Unlike mathematics and reading, there is no significant difference in the science performance of boys and girls across the OECD (OECD, 2023[1]). However, on average across LAC countries, boys performed better than girls by 4 score points in science. Still, the average gender gap in performance between boys and girls in science is narrower than in reading and mathematics. In Panama, El Salvador and Paraguay, the difference between the science performance of girls and boys is not statistically significant. As in reading and mathematics, girls outperformed boys in science in Jamaica and the Dominican Republic by a large margin of 20 and 13 score points, respectively. In some LAC countries, such as Costa Rica (15 score points), Peru (14 score points), Chile (14 score points) and Mexico (14 score points), boys performed better than girls in science by the widest margins in comparison to all 81 participating PISA countries (Figure 3.3).

Figure 3.3. Gender gap in sciences performance in LAC countries, PISA 2022

Score point in science between boys and girls



Note: Statistically significant differences at 5% are displayed in a darker tone.
Source: OECD, PISA 2022 Database, Tables I.B1.2.3 and I.B1.4.19

Proficiency of LAC boys and girls according to PISA 2022

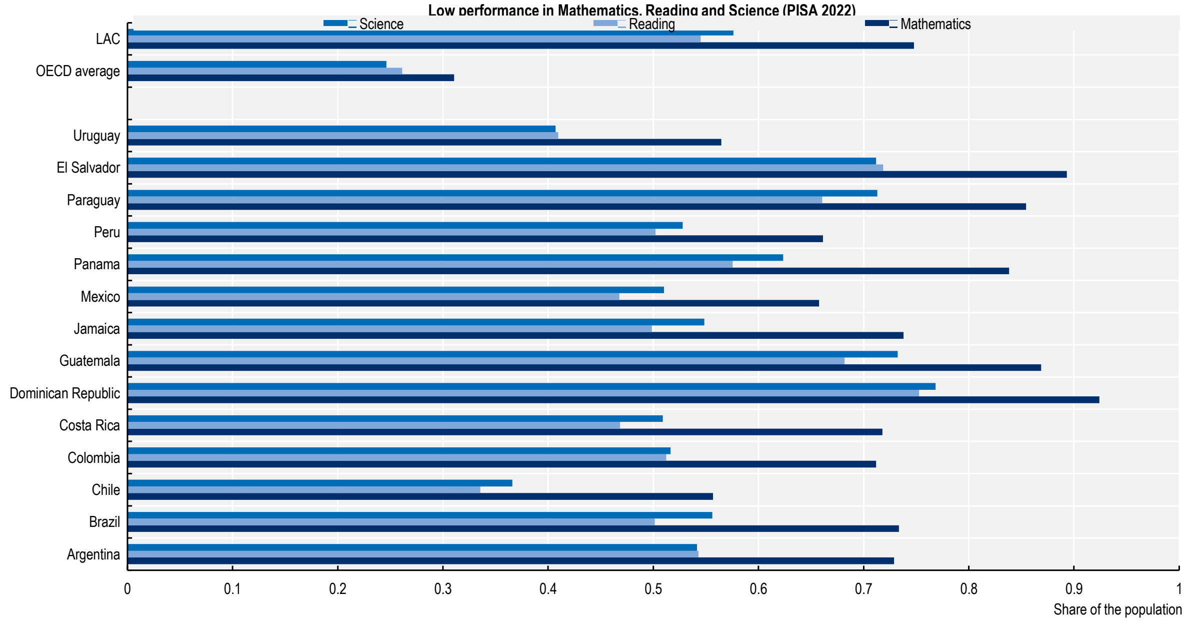
PISA 2022 data show that the region's youth have low levels of foundational learning: in reading and science, more than half of the region's 15-year-olds do not meet the minimum level of competencies while for mathematics, the percentage rises to 75% (OECD, 2023[1]) .

Without disaggregating by gender, PISA 2022 data show that Chile has the lowest rates of low performance in all three subjects, followed by Uruguay. On the other hand, of the 14 participating countries from the region, the Dominican Republic has the highest rates of low performance for all three subjects: 92% for mathematics, 75% for reading, and 77% for science (Figure 3.4). It is worth noting that, in all countries in the region, mathematics is the subject with the highest rates of low performance.

As much as the gender gaps in mean performance provide important insights into their skill acquisition and development within each country, gender differences at different proficiency levels are equally important. Figures 3.5 and 3.6 show the percentage of low performers among girls and boys in mathematics and reading in each country. Low performers are categorised as those below Level 2 (420.07 points), which is considered the minimum proficiency standard according to PISA (OECD, 2023[1]).

For Latin America and the Caribbean, this highlights that many students are not reaching basic proficiency, with over half of both boys and girls in the region failing to attain scores above the minimum proficiency level of Level 2 (Figure 3.4).

Figure 3.4. Share of low performers for all PISA subjects in LAC countries, PISA 2022



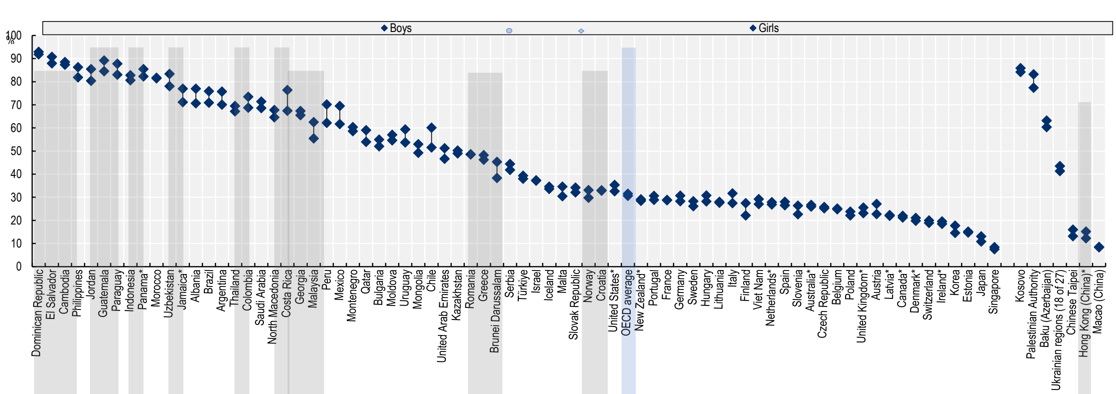
Source: OECD, PISA 2022 Database.

Shares of LAC boys and girls who are top and low performers in mathematics in PISA 2022

Figure 3.5 brings to attention an important pattern among low achievers in mathematics. In almost all LAC countries and OECD countries on average, the share of low achievers (students scoring below Level 2) in mathematics is greater among girls than boys, with Jamaica as the sole exception (OECD, 2023[1]).

Figure 3.5. Low performers in mathematics, by gender, PISA 2022

Percentage of students who scored below proficiency Level 2 in mathematics, by gender



Source: OECD, PISA 2022 Database, Table I.B1.4.31

Both the Dominican Republic and Jamaica stand out in the previous analyses as girls outperformed boys on average in reading, mathematics and science. However, the above figure shows that 93% of girls and 92% of boys in the Dominican Republic were not able to achieve a score that situated them at even the minimum proficiency level. Meanwhile, in Jamaica the shares are lower but still high, with 78% of girls and 71% of boys as low achievers. At a regional level, the proportion of low achievers is considerably higher in LAC countries compared to the OECD average, with a pronounced gender gap. On average, 77% of girls are low performers compared to 72% of boys, a five-percentage-point difference. This gender disparity is much larger when considering the OECD average, where the gap in low achievement between boys and girls is just 0.9 percentage points.

On average in the OECD, 31% of girls and 30% of boys are classified as low achievers in mathematics, whereas in the 14 participating LAC countries, an average of 77% of girls and 72% of boys scored below Level 2 in mathematics. In Costa Rica, Peru, Chile and Mexico, the percentage of low performers among girls exceeded that of boys by more than 6 percentage points. These patterns are concerning from a gender perspective as the share of girls who are low performers in mathematics has increased in most countries since PISA 2018 (OECD, 2023[1]). The growing number of girls failing to achieve minimum proficiency in mathematics is likely to further deter their participation in STEM subjects, exacerbating the already low representation of women in these fields and impacting their ability to develop and maintain numeracy skills as adults. The underrepresentation of girls and women in STEM fields has long been a significant concern as it limits their employment and income prospects (Encinas-Martín and Cherian, 2023[3]).

Similar to low performers who fail to attain Level 2 in a subject, those who reach Level 5 (above 606.99 points for PISA 2022) or higher in a subject are considered top performers. As in PISA 2018, there are more boys than girls who are high achievers in mathematics across all countries. In LAC countries, only 0.4% of boys and 0.1% of girls reached the highest proficiency level in mathematics, while an average of 11% of boys and 7% of girls attained this level in the OECD (OECD, 2023[1]).

Shares of LAC boys and girls who are top and low performers in reading in PISA 2022

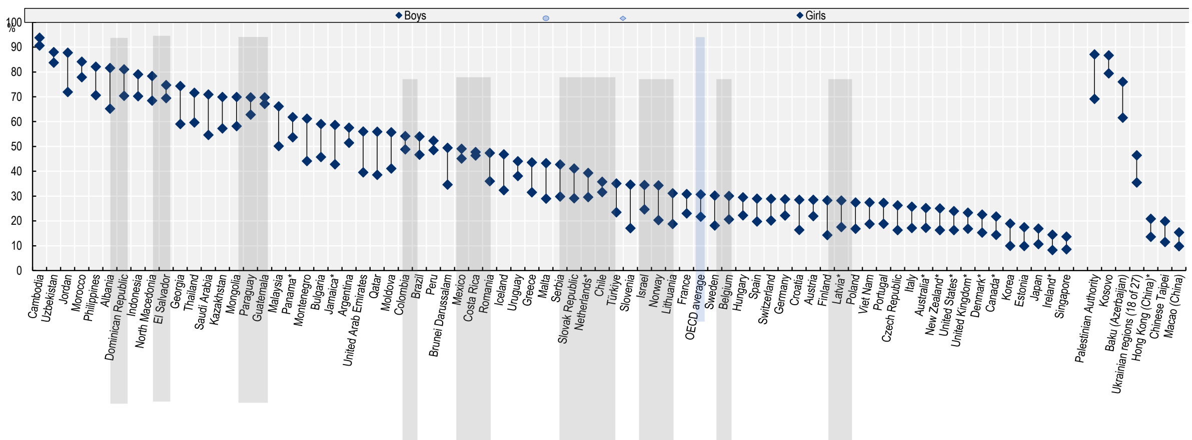
In Latin America, 55% of students are low performers in reading, more than double the rate reported by OECD countries (26%) and more than three times the percentage of students in the top 10 countries with the best results (15%). Arias Ortiz et al. (2023) point out that only 3 out of 12 countries in the region have managed to significantly reduce the percentage of students with low performance in reading between 2018 and 2022 (Arias Ortiz et al., 2023[4]).

Unlike mathematics, in reading, boys are overrepresented in the lower-performing group in all countries and regions. In both the OECD and LAC regions, the difference in the proportion of boys and girls in the low-achiever category is similar, with a gap of 9 percentage points in the OECD and 6.4 percentage points in LAC, both favouring girls. In the Dominican Republic and Jamaica, however, the gap is more pronounced, with the share of low achievers among boys surpassing that of girls by 16 percentage points in Jamaica and 11 percentage points in the Dominican Republic. Overall, the proportion of low achievers is significantly lower in the OECD, with 31% of boys and 22% of girls compared to 56% of boys and 50% of girls in the LAC region (OECD, 2023[1]).

Among high achievers in reading, the pattern is the opposite. Girls are equally or overrepresented in the top performer category and in no country is the share of boys who are top performers greater than the share of girls (Figure 3.6). However, the proportion of top performers is significantly higher in the OECD compared to LAC, with 6% of boys and 8% of girls in the OECD versus just 0.8% of boys and 1% of girls in LAC (OECD, 2023[1]).

Figure 3.6. Low performers in reading, by gender, PISA 2022

Percentage of students who scored proficiency Level 2 in reading, by gender



Source: OECD, PISA 2022 Database, Table I.B1.4.32.

Explaining the gender gaps in mathematics and reading

There are many possible reasons for boys' poor performance in reading and girls' underrepresentation at the highest proficiency level in mathematics – many relate to differences in behaviour between boys and girls, and differences in their attitudes towards learning.

Previous evidence suggests that the association between academic performance and enjoyment of reading is strong (OECD, 2015[5]; Guthrie, Schafer and Huang, 2001[6]; Mol and Jolles, 2014[7]) and that the influence runs in both directions (Mol and Bus, 2011[8]). Students who enjoy reading and make it a regular part of their lives are able to improve their reading skills through practice. Better readers tend to read more because they are more motivated to read, which, in turn, leads to improved vocabulary and comprehension skills (Sullivan and Brown, 2015[9]). In all PISA-participating countries and economies in 2018, girls reported much higher levels of enjoyment of reading than boys. On average across OECD countries, 24% of 15-year-old boys and 44% of girls the same age agreed that "Reading is one of my favourite hobbies" while 60% of boys but 39% of girls agreed that "I read only to get information that I need" (OECD, 2019[10]).

Boys may also eschew reading to build their "masculine" social identity and status among peers since reading is viewed as more "feminine" (Espinoza and Strasser, 2020[11]). The belief that reading is not masculine may derive, in part, from the fact that boys are not exposed to reading early in their lives in the same way as girls. Fathers are, for example, less likely to read than mothers and fathers are less likely to read to sons than to daughters (Auxier et al., 2021[12]; Leavell et al., 2011[13]).

On the other hand, girls have also been found to have higher levels of math anxiety (Foley et al., 2017[14]), less confidence in their math abilities (OECD, 2015[5]), and a greater distaste for mathematics (Bharadwaj et al., 2016[15]). Much of this is driven by narratives around mathematics as a subject in which boys perform better (Justicia-Galiano et al., 2023[16]). According to PISA data, girls – even high-achieving girls – are also more likely to express strong feelings of anxiety towards mathematics. In the 81 countries and economies that participated in PISA 2022, girls reported more often, and to a larger extent than boys, fear of failure (OECD, 2023[1]). PISA reveals that self-efficacy (the extent to which students believe in their own ability to solve specific mathematics tasks) and self-concept (students' beliefs in their own mathematics abilities) are much more strongly associated with performance among high-achieving than low-achieving students. Still, at every level of performance, girls tend to have much lower levels of self-efficacy and self-concept in mathematics and science. And while girls have less self-efficacy and lower self-concept, they tend to be highly motivated to do well in school, more than boys, and to believe that doing well at school is important.

Girls also tend to fear negative evaluations by others more than boys and are eager to meet others' expectations for them (Encinas-Martín and Cherian, 2023[3]). Given girls' keen desire to succeed in school, their fear of negative evaluations, and their lower self-confidence in mathematics and science, it is hardly surprising that high-achieving girls choke under (often self-imposed) pressure. In fact, even when controlling for test scores, high-school boys evaluate their math abilities as higher than girls'. Boys' self-assessment is also less likely to be impacted by lower grades (Zander et al., 2020[17]).

Biases held by parents, teachers and peers – whether conscious or subconscious – also play a key role in these gendered differences in student academic performance. These biases may themselves lead to disparities in interests, learning motivation and educational outcomes, contributing to later life differences in field of study and occupation (OECD, 2019[10]; Carrell, Page and West, 2010[18]; Dee, 2007[19]; Gevrek, Gevrek and Neumeier, 2020[20]; Bian, Leslie and Cimpian, 2017[21]; Carlana, 2019[22]; Baker and Milligan, 2016[23]; Lavy and Sand, 2018[24])

An example is seen in the gender stereotypes that girls face at home, in school and within their communities. Parents still harbour stereotypical notions of what girls and boys excel at and the careers they can pursue when they enter the labour market. In all PISA countries and economies that distributed the parent questionnaire in 2012, parents were more likely to expect their sons, rather than their daughters, to work in a STEM field. These gender stereotypes are often reinforced in the classroom and are related to teachers' conscious or unconscious biases about girls' and boys' strengths and weaknesses in various subjects, which are invariably reflected in student performance (OECD, 2015[5]). Student performance, in turn, is also related to students' career expectations and field-of-study choices later on. PISA 2022 shows that, on average across OECD countries, only 10.7% of girls reported that they expect to work as professionals in science or engineering while 15% of boys so reported. Such decisions can have negative consequences for women's labour market prospects (OECD, 2023[1]).

Key takeaways for the LAC region from PISA 2022

Both the proportion of students achieving minimum proficiency in core subjects and the provision of equal opportunities by gender are key indicators of how equitable an education system is. An inclusive education system ensures that all students meet baseline standards in core subjects; a fair system guarantees equal opportunities regardless of gender. Equity in education requires both inclusion and fairness (OECD, 2023[1]).

In light of PISA 2022, it is clear that education systems in the LAC region fall short of being equitable. The high percentage of low performers in core subjects, coupled with the clearly gendered profile of low performers – boys underperforming in reading and girls in mathematics – calls for urgent attention. While gender gaps in average performance are slightly narrower in LAC compared to the OECD, the persistent gaps among low achievers, particularly in mathematics for girls and reading for boys, highlight the need for targeted support. Effective policy changes must ensure that both boys and girls receive quality education that enables them to achieve at least minimum proficiency in all fields of study.

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4 Career choice by gender: How girls and boys choose different fields of study, especially in STEM

This chapter examines gender disparities in career choices, particularly in STEM fields, in Latin America and the Caribbean (LAC). Despite policies encouraging gender equality, significant disparities remain, with many girls and women choosing not to study or work in STEM fields. The chapter highlights the economic and societal benefits of increasing female participation in STEM, citing evidence from other regions. For instance, the European Union and the United States have projected substantial economic gains from greater gender inclusion in STEM. Understanding these dynamics necessitates exploring career decisions made during adolescence, the persistence of gender-based career segregation and the factors shaping these choices. The chapter underscores the importance of addressing these barriers to foster greater gender equality and economic growth.

Introduction

In Latin America and the Caribbean (LAC), governments and organisations have increasingly implemented policies to encourage students to explore career paths where their girls and boys are underrepresented. Programmes aimed at supporting girls in science, technology, engineering, and mathematics (STEM) fields as well as initiatives promoting careers in healthcare and education for boys have become more common across the region. These efforts address not only labour shortages in key sectors but the structural and cultural barriers that have historically discouraged young people from pursuing careers aligned with their interests and talents.

Despite these initiatives, gender disparities persist throughout the STEM educational and career trajectory. At every stage, from early childhood interests to professional development, girls and women are more likely than their male counterparts to choose *not* to study or work in STEM fields (Diekman, Clark and Belanger, 2019[1]). Addressing these barriers is not only critical for gender equality but also for economic growth. The underrepresentation of women in STEM fields perpetuates gender inequality in the labour force and represents a missed economic opportunity.

Some studies have argued that there are potential economic gains to increasing women's participation in STEM. It has been estimated that, in the European Union, raising the number of women in STEM careers could increase employment rates and boost GDP per capita by up to 0.7-0.9% by 2030 and up to 3% by 2050, (an increase in monetary terms of almost EUR 820 billion), with an increase in employment of 1.2 million jobs (European Institute for Gender Equality, 2017[2]). Similarly, in the United States, it has been claimed that tripling the number of women in computing could increase women's cumulative earnings by USD 299 billion (Accenture & Girls Who Code, 2016[3]).

While similar estimates for LAC have not been calculated, research suggests that all economies stand to benefit from greater female participation in STEM. Beyond economic returns, incorporating more women in STEM creates a multiplier effect: it enables women to access higher wages, contributes to national development and provides young girls with role models who challenge traditional gender norms in STEM careers (Schomer and Hammond, 2020[4]). Additionally, increasing the number of girls and women in STEM brings new perspectives and problem-solving approaches (Cropley, 2021[5]), fostering innovation and broadening the scope of scientific inquiry to address a wider range of societal challenges (Saucerman and Vasquez, 2014[6]).

A compelling example of how gender equality in STEM can drive meaningful change is the Block by Block initiative in Viet Nam. This programme used the video game Minecraft to get adolescent girls involved in participatory urban planning. By creating digital models of their communities, the girls identified safety concerns and proposed solutions, which they then presented to local and international authorities. Their efforts led to tangible commitments, including improved street lighting and the installation of a safety fence around a hazardous canal (Plan International, 2018[7]). This example underscores the transformative potential of equipping women and girls with STEM skills – not only for their own empowerment but also for the betterment of society as a whole.

Understanding these dynamics requires a closer examination of the career choices made during adolescence, the extent of gender-based career segregation in LAC from both regional and historical perspectives, and the factors shaping these choices. This chapter explores these dimensions, shedding light on the barriers that continue to limit opportunities for young women in STEM and the policies that can help foster greater inclusion.

Girls and boys often aspire and expect to work in different careers

Occupational expectations at age 15 matter. Thinking about what career one wants to have is a dialogue between a young person's current interests and their imagined future, and it steers decision making through education and training. In most OECD countries, most students now enrol in upper secondary education and large numbers then proceed to post-secondary education or training programmes. The decisions that young people make around the ages of 15 to 16 about what they will study, where they will study and how hard they will apply themselves at school impact the kinds of possibilities that will be open to them in the future. This has society-wide implications, too, in terms of the flow of skills into the labour market. In economic terms, young people are making crucial decisions about the investments they will make in their initial accumulation of human capital. For many, this period will be their most substantive lifelong investment in formal education and training.

Analysis of PISA data shows that gender is significantly related to the career expectations of students at age 15 (Musset, 2018[8]). For individuals, the strong influence of gender on occupational thinking can close down options, reducing students' choices as they seek roles in the labour market that best reflect their interests, aptitudes and abilities.

While in most countries today women attain higher levels of education than men, they are, on average, less likely than men to be employed. They also earn less in the same positions (Hegewisch and Tesfaselassie, 2019[9]; Picatoste, Mesquita and Laxe, 2022[10]). Some reasons for these gender gaps are already apparent at an early age. Recent work by the OECD based on the International Early Learning and Child Well-being Study (IELS), for example, finds that one in four of the top 30 most popular jobs selected by 5-year-old girls are in traditionally female-dominated occupations. Five-year-old boys, on the other hand, select traditionally male-dominated occupations for more than half of the top 30 most popular jobs (OECD, 2021[11]). This is corroborated by Drawing the Future, a survey of over 20 000 children aged 7- to 11 years-old, which finds that girls' and boys' career choices are clearly shaped by gender-specific ideas about jobs, with boys choosing jobs in traditionally men-dominated spaces and girls choosing jobs in traditionally women-dominated spaces (Chambers et al., 2019[12]).

These gendered career choices persist through to adolescence. Girls overwhelmingly expect to work in currently women-dominated occupations, including personal care, health and teaching, and overwhelmingly do *not* expect to work in currently men-dominated occupations, such as information and communication technologies (ICT) and the trades (OECD, 2024[13]). According to OECD PISA data, even when girls outperform boys academically in secondary school, they are less likely than their male peers to choose more technical academic pathways such as science, mathematics or computing, which lead to the highest-paid professions. PISA 2022 shows that, on average across OECD countries, only 10.7% of girls reported that they expect to work as professionals in science or engineering compared to 15% of boys (OECD, 2024[13]). Even when girls choose these academic fields, their career aspirations often differ: data show that girls are more likely to aim for STEM-related careers in biology and health while boys prefer engineering professions (OECD, 2015[14]; OECD, 2024[13]). Evidence from longitudinal studies suggests that adolescents' expectations are a good predictor of future jobs (Mann et al., 2020[15]).

Girls and boys in LAC also aspire and expect to work in different careers

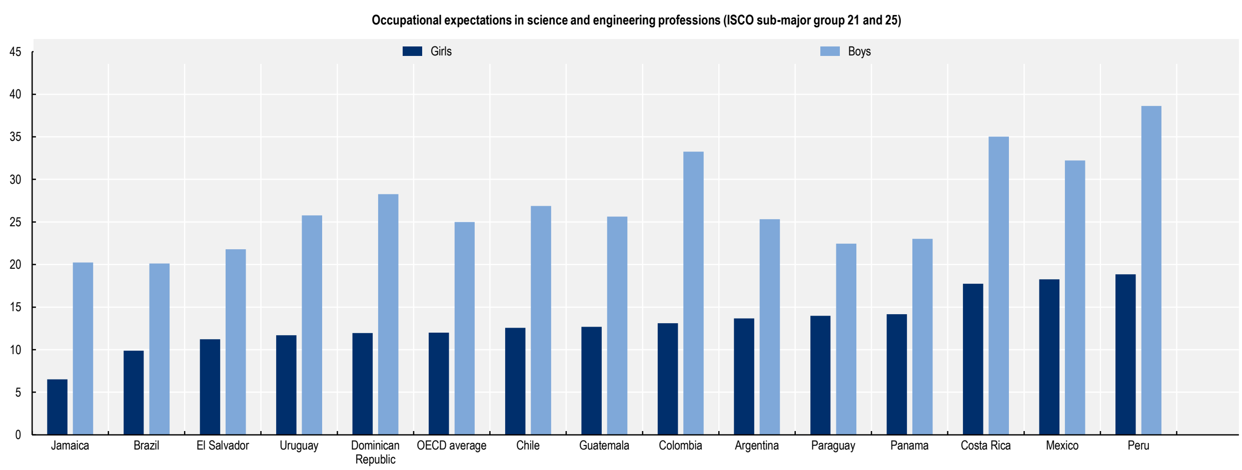
PISA asks students about the job they expect to have when they are 30-years-old. On average across OECD countries, the proportion of girls (10.7%) reporting that they are interested in a science-related career is lower than that of boys (15%). However, decompositions by type of occupation show a much starker gender gap (OECD, 2024[13]). Specifically, 10.4% of boys but only 4.3% of girls reported that they expect to work as professionals who use science and engineering training (e.g. engineer, architect, motor vehicle mechanics etc.). More boys than girls reported that they expect to work in these types of occupations in *all* PISA-participating countries/economies. The gender gap in expectations of becoming an engineer (or any related occupation) is especially wide in the United Kingdom, Dominican Republic, Peru, France, Chile and Guatemala where it exceeds 10 percentage points (OECD, 2024[13]). These are also countries where more than one in five boys reported that they expect to work as an engineer or in a similar occupation.

Expectations about working in ICT-related occupations also appear to be highly gender-biased. Only a tiny share of girls – 1.3% – reported that they want to work as ICT professionals (e.g. software developer, applications programmer) compared with 10% of boys (OECD, 2024[13]). While in some countries, such as Estonia, Lithuania, North Macedonia, Moldova and Ukraine, more than 16% of boys reported that they expect to work in an ICT-related profession, in no PISA-participating country or economy does this share exceed 7% of girls (OECD, 2024[13]).

Across the Latin-American and Caribbean (LAC) countries included in PISA 2022, only a small minority of girls (between around 5 and 19% in most countries) reported that they expect to work in a STEM-related occupation (Figure 4.1). Boys are more than twice as likely as girls to report this expectation in most of the LAC countries. The gender gap in expectations is especially large in LAC countries like Colombia, Peru, Costa Rica and Dominican Republic where boys are over 15 percentage points more likely than girls to report that they expect to pursue a career in a STEM-related occupation.

Figure 4.1. Girls' and boys' expectations of working in STEM-related occupations in the LAC countries participating in PISA

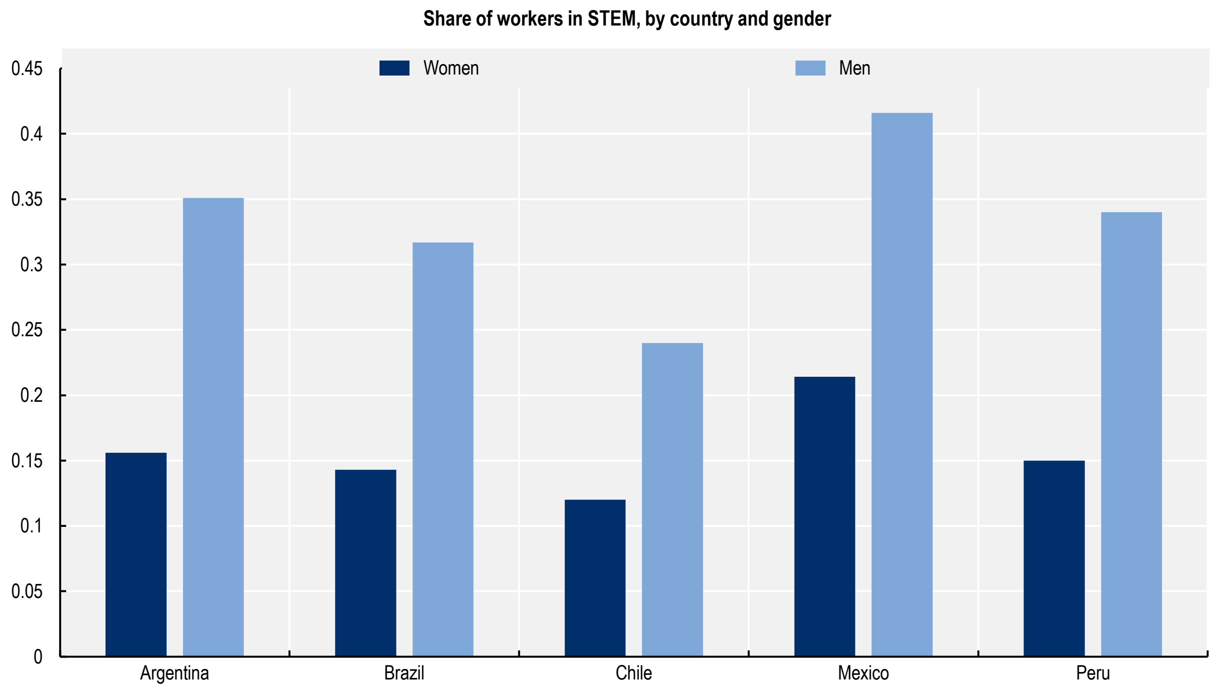
Occupational expectations in science and engineering professions (ISCO sub-major group 21 and 25)



Note: The figure shows the percentage of 15-year-old students (PISA) who expect to work in a STEM-related occupation at the age of 30. STEM occupations are defined using the following 2-digit categories of the ISCO-08: 21 (science and engineering professionals) and 25 (information and communications technology professionals). The OECD average shows unweighted means.
Source: OECD, PISA 2022 data (OECD, 2024[13]).

The World Economic Forum's 2024 analysis of LinkedIn data on STEM skills and employment highlights the global scale of gender disparities in STEM (World Economic Forum, 2024[16]). It also closely aligns with the gender gaps observed in career expectations. Across all 39 countries included in the analysis, men consistently outnumber women in STEM occupations: globally, 31.0% of men work in STEM compared to just 15.6% of women. In none of these countries do women represent more than half of the STEM workforce and in only six countries do women make up more than one-third of STEM professionals. Among the five Latin American and Caribbean countries included in the analysis – Argentina, Brazil, Chile, Mexico and Peru – men are approximately twice as likely as women to work in STEM occupations (Figure 4.2)

Figure 4.2. Share of workers in STEM fields in selected LAC countries, by gender

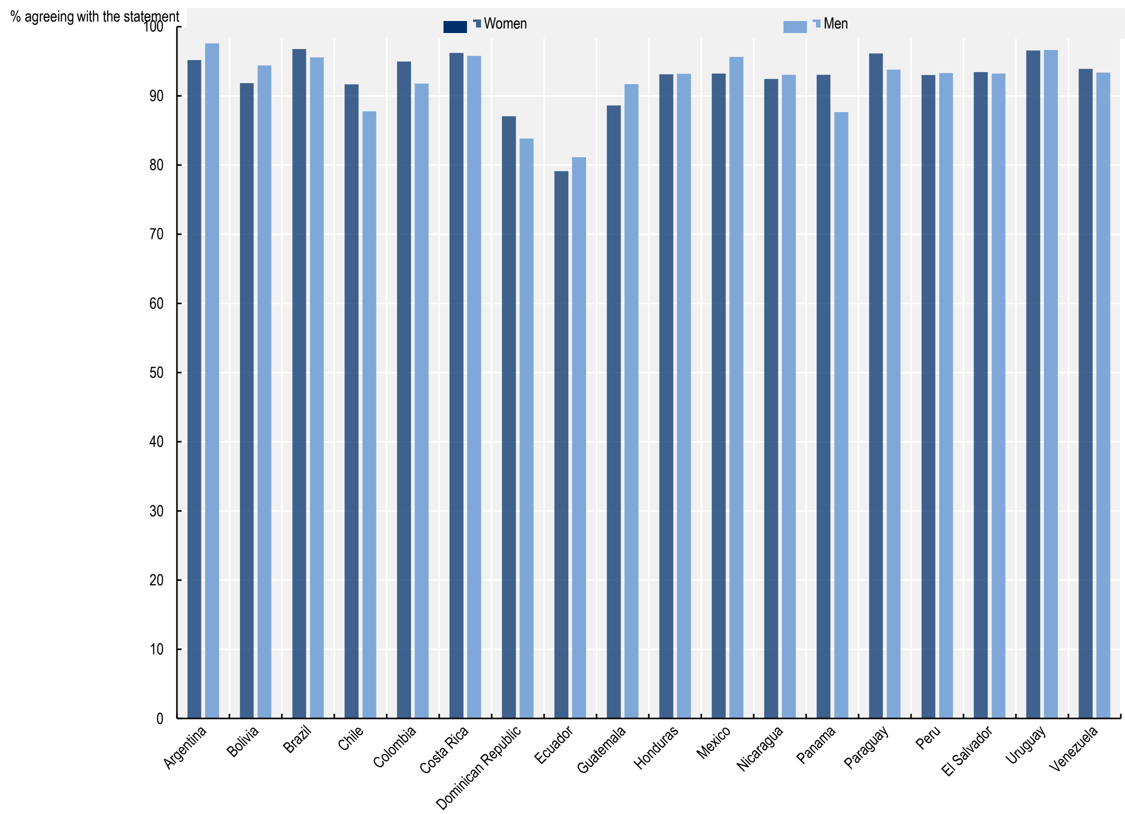


Source: LinkedIn Economic data, World Economic Forum 2024 (World Economic Forum, 2024[16]).

This pattern is further corroborated by the Center for Distributive, Labor and Social Studies' (CEDLAS) analysis of 2018 household survey data, which shows a strong correlation between young people's career expectations and their eventual occupational outcomes (Berniell, Fernández and Krutikova, 2025[17]). Of the 14 LAC countries participating in PISA, CEDLAS data are available for 10. In these countries, the proportion of young adults (ages 30–40) working in STEM closely reflects the gender gap in PISA career expectations. In most cases, fewer than one in five women in this age group are employed in STEM while the corresponding share for men is two to three times higher. Countries with the most pronounced gender gaps in expectations – such as Chile, Colombia, Mexico and Peru – also have the widest disparities in actual STEM employment.

Despite the pronounced gender gaps in math self-confidence and expectations about working in STEM occupations, and actual patterns of work in STEM occupations, there is widespread agreement in LAC countries that women and men have the same capacity for science and technology. Using data from Latinobarometro, Figure 4.3 shows that in most countries across the region in 2018, over 90% of respondents agreed or strongly agreed with the statement that "Women have the same capacity for science and technology as men" (Berniell, Fernández and Krutikova, 2025[17]). The Dominican Republic and Ecuador have the lowest levels of agreement in the region but even there the agreement rate is around 80%. (Figure 4.3) also shows that this high level of agreement extends to both women and men with only small gender differences.

Figure 4.3. Percentage of individuals agreeing that women and men have the same capacity for sciences and technology



Note: Individuals aged 25–55 years old. This figure shows the percentage of individuals who agreed or strongly agreed with the statement "Women have the same capacity for science and technology as men." The average bars show unweighted means.
Source: (Berniell, Fernández and Krutikova, 2025[17]). Calculations based on Latinobarometro, 2018

The underrepresentation of women in STEM fields is a complex issue influenced by societal, cultural and systemic barriers, particularly in engineering and technology. Research has found childhood and early adolescence to be a key period in which gender differences in degree preferences and occupational aspirations are established and often cemented (OECD, 2021[11]). This shows the importance of sparking a science career interest early on. To attract more women to STEM careers, focusing on primary and secondary education before young women sort out into higher education is essential. The following section of this chapter explores the barriers that girls encounter in educational settings that discourage them from pursuing STEM careers. It also examines the role educators can play in fostering girls' interest in STEM fields.

Explaining differences in career expectations for boys and girls

Previous research has brought to light several barriers that discourage girls in secondary education from choosing STEM pathways. These include socio-cultural norms and stereotypical expectations; lack of female role models; stereotypes about ability and aptitudes; gender-biased classroom interactions; gendered marketing and media; peer pressure and self-perceptions; and digital inequalities.

Socio-cultural norms and stereotypical expectations

From a young age, girls are often exposed to cultural and social norms that suggest STEM careers are not suitable for them (Miller, Eagly and Linn, 2015[18]). STEM fields are frequently stereotyped as masculine, analytical and lacking in social or creative aspects (Leslie et al., 2015[19]). Stereotypes are translated into subtle or explicit messages coming from parents and teachers. A meta-analysis of 43 articles (with 48 different samples, countries not reported) found that parents' stereotypes on gendered interests and abilities affected children's occupational roles beliefs about others and themselves (Tenenbaum and Leaper, 2002[20]). These messages can shape beliefs about girls' and young women's abilities and roles and limit their interest in STEM fields as they may feel they do not align with societal expectations (Guidry, 2000[21]; Silverman, Constantinou and Manson, 2009[22]; Tellhed, Bäckström and Björklund, 2017[23]).

Additionally, teachers' evaluations of students' performances may be influenced by gender stereotypes (Holder and Kessels, 2017[24]). Since these stereotypes often suggest that boys excel more in mathematics and science, studies from the Early Childhood Longitudinal Studies (ECLS) of kindergartners in the United States (Lubienski et al., 2013[25]) and data from Ireland show that parents and teachers are more likely to overestimate boys' and underestimate girls' achievements in mathematics. In Ireland, 1 in 7 nine-year-old children were affected by this biased perception (McCoy, Byrne and O'Connor, 2022[26]).

The same level of performance in these subjects is often perceived as more intelligent and competent when shown by boys rather than girls (Fiedler et al., 2002[27]). This is due to attributional gender bias, where boys' successes in mathematics are attributed to ability, while girls' successes are attributed to effort. Conversely, boys' failures are seen as a lack of effort and girls' failures are viewed as a lack of ability (Espinoza, Arêas da Luz Fontes and Arms-Chavez, 2014[28]).

Lack of female role models

The limited visibility of women in STEM fields can make it difficult for girls to envision themselves pursuing careers in these areas. The lack of female role models and mentors, such as peers, educators and other adults in their social circle, can reinforce the perception that STEM is a male-dominated domain, discouraging girls from considering it as a viable option.

Research shows that female role models can influence girls' preferences for STEM studies, inoculating them against the harmful impact of stereotypes. For example, a paper evaluating a role-model intervention in Spain in which female volunteers working in STEM went into schools to talk to 12–16-year-old girls about their careers finds that, on average, role models have a positive and significant effect on mathematics enjoyment, importance attached to math, expectations of success in math and girls' aspirations in STEM, and a negative effect on gender stereotypes (González-Pérez, Mateos de Cabo and Sáinz, 2020[29]). Another study in Spain analysed the impact that a group mentoring initiative led by a female STEM role model had on 10–12-year-old students and shows the programme had a positive impact on students' attitudes towards technology, increased the number of female STEM references they knew, and improved their opinions of vocations and professions related to science and technology. While both boys and girls experienced these, the impact was greater among girls (Guenaga et al., 2022[30]). A paper in the United States examining the role of the demographic composition of high-school math and science faculty on university students' decisions to pursue STEM fields finds that female undergraduate students who have had more female teachers are more likely to declare a STEM major. Having women STEM teachers increased women students' chances of pursuing STEM by 14% and high-performing women by 44% (Bottia et al., 2015[31]).

Female role models may be key not just to increasing the number of women who enter STEM fields but retaining those who are already in STEM fields by improving women's performance and sense of belonging (Drury, Siy and Cheryan, 2011[32]). This is important because women are actually more likely to leave STEM careers than men (Herrmann et al., 2016[33]) and to experience workplace incivility or mistreatment in STEM environments (Saxena, Geiselman and Zhang, 2019[34]). A sense of fit is critical to attracting and retaining more women in STEM. Fit indicates that an individual has the skills and ability valued in these fields and that their contributions will be recognised by others (Diekman, Clark and Belanger, 2019[1]).

Finally, girls and young women often experience a lack of leadership models at school. According to the OECD's Teaching and Learning International Survey (TALIS) 2018 data, about 68% of all teachers in the 48 countries surveyed were women but school principals were predominantly men. Between 2013 and 2018, only 45% of school principals were women (OECD, 2020[35]).

Stereotypes about ability and aptitudes

Research has shown that the different experiences and expectations that girls face in educational settings can affect their self-perceptions of STEM ability and aptitude. This discourages or deters them from pursuing STEM subjects (Green and Sanderson, 2018[36]; Wang and Degol, 2017[37]). Called stereotype threat, this is the fear of confirming negative stereotypes associated with one's identity. When girls and young women are evaluated on STEM subjects, they worry that their performance will be judged according to this stereotype and fear the results will confirm they are indeed incompetent. This fear can undermine their performance, confidence and persistence in these fields (Shapiro and Williams, 2012[38]) .

A study in Spain among secondary-school students shows that boys are seven times more likely than girls to believe they can study engineering (de las Cuevas, García-Arenas and Rico, 2022[39]).

A review in Australia of 36 papers on gender disparities among Australian university STEM students shows that the primary challenge faced by female students is diminished self-efficacy in STEM subjects (Fisher, Thompson and Brookes, 2020[40]).

Experiencing stereotypes over the long term can lead women to distance themselves from STEM (Diekman, Clark and Belanger, 2019[1]). To increase women’s interest in STEM majors, gender-stereotypical competence beliefs need to be counteracted so that women believe they have what it takes to handle STEM careers.

Gender-biased classroom interactions

Gender-biased classroom interactions refer to unequal treatment or differential experiences that students may face based on their gender (Graham et al., 2022[41]). These interactions can manifest themselves in various ways, such as teacher-student interactions and classroom practices. This can limit girls’ confidence, engagement and participation in STEM subjects.

For example, a study examining gender disparities at the undergraduate level in biology in the United States finds that, although females represented, on average, 60% of students, they made up less than 40% of students responding to instructor-posed questions to the class (23 classes were observing including almost 5 000 students) (Eddy, Brownell and Wenderoth, 2014[42]).

Grading bias can also show a pattern of teachers’ biased grading of their female students in STEM classes (Thacker, Copur-Gencturk and Cimpian, 2022[43]). For instance, a randomised controlled study in the United States examining teachers’ evaluations of mathematical solutions to which gender names had been randomly assigned finds that, when assessing students’ mathematical ability, biases against female students emerge, with teachers’ estimations of students’ mathematical ability favouring boys over girls (Copur-Gencturk et al., 2020[44]).

Gendered marketing and media

Advertising and media often portray stereotypical gender roles in which girls are typically shown in activities related to beauty, fashion and domesticity while boys are depicted as active, adventurous and inclined towards science and technology (Marttinen et al., 2020[45]). These gendered messages can create a subconscious bias that associates certain careers with specific genders. Girls may internalise these stereotypes and perceive STEM careers as more suitable for boys, leading to self-doubt and a lack of confidence in pursuing such paths.

Media has for many years reflected a gender bias in the depiction of STEM professionals. A review examining historical trends in media images of STEM professionals shows that popular media depicts women as less likely than men to be in STEM fields and less likely to be talented, successful and valued in STEM fields (Steinke, 2017[46]). A study examining the prevalence and portrayals of female STEM characters in 48 popular films from the United States finds that female STEM characters were outnumbered by male STEM characters in speaking roles by 2 to 1 (Steinke and Paniagua Tavarez, 2017[47]). Presenting a greater number and more diverse portrayals of female STEM characters would boost girls' and young women's identification with STEM characters and future interest in STEM careers (Steinke and Paniagua Tavarez, 2017[47]).

Peer pressure and self-perceptions

Peer relationships and interactions vary between boys and girls, shaping activity choices and social dynamics in childhood and influencing later school experiences and academic trajectories (Fabes et al., 2014[48]). As children grow older, peer influence can discourage girls from developing an interest in and identifying with STEM fields, particularly when gender stereotypes are reinforced within their social circles (Wang and Degol, 2017[37]).

Supportive peer groups can foster girls' sense of belonging in STEM. When peers value and encourage STEM engagement, they reinforce girls' confidence and motivation to pursue these fields (Leaper, 2015[49]). Research in secondary education in the United States finds that adolescents aged 13–19 (n=6,457) with peers who promoted high achievement in STEM subjects were more likely to enroll in additional math courses themselves (Crosnoe et al., 2008[50]).

Conversely, girls and women may face rejection and hostility from male peers regarding their STEM achievements (Leaper, 2015[49]). Exposure to exclusionary messages during adolescence can significantly impact their intentions to pursue STEM careers. For example, a study surveying high-school students in the United States (n=1,273) finds that girls in classrooms with a higher proportion of male peers endorsing explicit gender stereotypes in STEM are significantly less likely to express interest in pursuing a degree in computer science or engineering. In contrast, exposure to confident female peers in science classrooms has a positive effect, increasing the likelihood of girls considering these fields (Riegle-Crumb and Morton, 2017[51]).

Digital inequality

The stereotype of technology as a male domain is pervasive in many contexts and appears to affect girls' confidence in their digital skills from a young age (West, Kraut and Chew, 2019[52]). According to PISA 2022 data, across OECD countries, 1.3% of girls aspire to an ICT-related job compared to 10.0% of boys at age 15 (OECD, 2024[13]).

Building on survey data collected from 10 820 children aged 12–16 in 14 European countries (Czechia, Estonia, Germany, Italy, Lithuania, Malta, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain and Switzerland), Mascheroni et al. (2022) investigated how children may fall behind in digital skills. Gender (being female) was found to negatively affect self-efficacy in digital skills (Mascheroni et al., 2022[53]). A study of the ICT uses and attitudes of 11–13-year-old students in Spain finds a prevalence of stereotypes about differences in skills and professional vocation among teenagers and a gender difference in attitudes toward computers or self-efficacy. Boys and girls showed stereotyped images of their mothers' and fathers' digital skills, and ICT jobs. Girls using computers also had higher levels of anxiety and lower self-confidence than boys (Cussó-Calabuig, Farran and Bosch-Capblanch, 2017[54]). It is important to take into account gender differences in digital use, skills and self-efficacy when looking at STEM education. They relate directly to the chances of girls and young women pursuing certain engineering degrees and indirectly to the acquisition of digital skills that are increasingly valued in most professions.

Enhancing career guidance to promote more equitable STEM career aspirations

Early career awareness and gendered aspirations

Research indicates that children begin forming career aspirations as early as age five. Large-scale studies across multiple countries reveal that these early career ambitions are often highly gendered, particularly among boys (OECD, 2021[11]). While children's preferences reflect their interests, they are also shaped by the career opportunities they have been exposed to and the societal assumptions surrounding gender roles. As a result, effective career guidance should start in primary school, offering students the opportunity to explore diverse career paths and challenge stereotypes throughout their education. Introducing career guidance early fosters a culture of reflection and exploration during formative years, supporting long-term engagement in education and personal development.

Expanding career perspectives in secondary education

OECD analysis of longitudinal data highlights that career guidance activities enabling active exploration of professional futures are strongly linked to improved employment outcomes in adulthood (Covacevich et al., 2021[55]). These include direct interactions with professionals through workplace visits, job fairs and career talks. By exposing young people to professionals in underrepresented fields, these initiatives broaden students' career aspirations and challenge implicit gendered biases about career paths. These interventions are particularly impactful during lower secondary education before students make key academic and vocational choices.

Engaging with role models who have overcome career-related obstacles can be especially influential. However, it is crucial that career guidance initiatives present a diverse and realistic range of professionals rather than being limited to those who have the flexibility to engage with schools (Archer and DeWitt, 2015[56]; Miller, 2022[57]). While interactions with STEM industry volunteers can help broaden career perspectives, they can also reinforce stereotypes if not carefully managed. Ensuring access to a wide and authentic representation of professionals is essential.

Facilitating career exploration through work-based learning

First-hand work experiences significantly enhance long-term career outcomes. Longitudinal studies link positive career development to teenage part-time work, volunteering and school-facilitated work placements (Covacevich et al., 2021[55]). These experiences allow students to build work-related skills, gain insights into career pathways and establish valuable professional connections.

For students considering careers where their gender is underrepresented, such experiences provide critical insights into workplace culture and potential challenges. National programmes such as Girls' and Boys' Days, first developed in Germany, offer students opportunities to shadow professionals in non-traditional career fields. These initiatives now reach out to tens of thousands of students in Germany and other countries, fostering connections with inclusive workplaces (OECD, 2015[14]).

Systematic career guidance to challenge gender stereotypes

Beyond one-off interventions, career guidance systems can integrate gender equality principles into structured frameworks that support students' career development. The career pathways model, commonly used in the United States and Canada, provides students with work-based learning experiences in vocational fields like healthcare and engineering while maintaining broad academic engagement. These programmes, typically spanning the final years of secondary education, have been shown to enhance employment outcomes (Covacevich et al., 2021[55]).

A notable example of a systematic approach is the Canadian province of New Brunswick's career development framework, designed in collaboration with the OECD. This framework outlines key stages in students' career development from early childhood through secondary education. Drawing on international research, it emphasises early recognition of stereotypes, increasing engagement with career professionals and awareness of structural barriers to career advancement. By ensuring that students, particularly those pursuing careers in fields where their gender is underrepresented, receive tailored support, such frameworks can foster more equitable career opportunities for all.

Box 4.1. Learning from policy initiatives in different countries

Over the last few decades, national policy interventions and research literature on the role of gender in shaping career thinking has focused particularly on girls in careers in science, technology, engineering and mathematics. Examples include:

- Under the National Innovation and Science Agenda (NISA), the Australian government invested AUD 13 million from 2016 to 2020 in encouraging more girls and women to study STEM and pursue STEM-based and entrepreneurial careers.
- The National Pact for Women in MINT Careers, widely known as Go Mint, was launched in 2008 at the instigation of the German Federal Ministry for Education and Research to increase young women's interest in scientific and technical degree courses – MINT is the German-language acronym for STEM. The Go Mint initiative brings together politics, business, science and the media to improve the image of STEM-related professions in society.
- Japan seeks to promote women's careers in STEM (RIKO in Japanese). Initiatives include the RIKO Challenge, which encourages more girls to take up a career in a STEM field. Together, industry, academia and the government promote leading female researchers and engineers as role models, hold events to give girls STEM job experience and take them on tours of firms and universities.
- The National Aeronautics and Space Administration (NASA) in the United States runs the Reach for the Stars: NASA Science for Girl Scouts programme, which focuses on girls. Through the NASA/Girls Scouts of the United States partnership, NASA scientists provide training sessions for Girl Scouts (NASA, 2023[58]).

Examples of successful programmes that encourage STEM careers among girls and women in Latin America and the Caribbean are mentioned in Chapter 6

Box 4.2. Current initiatives to reduce the gender gap in STEM in the LAC region

Initiatives by international organisations in the regions

International and regional organisations, including UNESCO, UN Women, the Inter-American Development Bank (IaDB), the International Development Research Centre (IDRC), the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), and the Organization of Ibero-American States (OEI), play a pivotal role in promoting gender equality in STEM across LAC. They do so through a range of research initiatives, capacity-building activities and cross-country programmes.

Many of these initiatives operate in multiple countries. Examples include the L'Oréal-UNESCO For Women in Science Fellowships, implemented in Argentina, Brazil, Chile, Colombia, Mexico, Panama, Peru, Uruguay and French Guyana; the UNESCO SAGA project, currently active in Argentina, Chile, Haiti, Jamaica and Uruguay; the TeachHER initiative; the IaDB's Gender Gaps in Science, Technology, and Innovation in LAC project (covering Colombia, Chile, Mexico and Panama); and the STEMPreneurs programme to support women entrepreneurs in STEM careers.

These organisations also bolster national efforts. For example, OEI supports studies on Peruvian women in science while UN Women collaborates with Brazil on the Mulher e Ciência programme. In Mexico and Central America, IDRC and CIESAS (Centro de Investigaciones y Estudios Superiores en Antropología Social) support Indigenous women in STEM through funding for research, professional development and networking.

The European Union has also contributed through Horizon 2020 and Erasmus+ initiatives, including ACTonGender, which builds communities of practice to foster institutional change for gender equality in research, and the W-STEM project, which aims to enhance recruitment and retention strategies for women in higher education STEM in Latin America.

Private-sector initiatives

Private-sector actors are also active. INTEL runs vocational and technical training initiatives in Costa Rica such as the Women at Intel (WIN) programme. Oracle supports women's leadership in Colombia through motivational talks under its Women Leadership Initiative. Uber has launched the Ellas programme in Costa Rica, Mexico and Peru, aiming to attract 1 200 girls to STEM through targeted workshops. Other companies – such as Accenture, Google and IBM – host meetings, conferences, virtual chats and camps to promote inclusion in the tech workforce.

Initiatives in the non-profit sector

Non-governmental organisations (NGOs) contribute significantly as well. Coderise.org offers coding education to underprivileged youth, aiming to boost social mobility through tech skills. Geek Girls LATAM empowers women across the region to actively engage in technology creation. R-Ladies Matemáticas en el Cono Sur, a subregional chapter of the global R-Ladies network, promotes more girls and women in research by organising mentoring, meetups, and safe learning spaces to support women in data science and STEM.

Source: (UN Women, 2020[59]).

Conclusion

Women are still less likely to expect to work in STEM fields, are underrepresented in STEM disciplines at the tertiary level, and face lower participation in STEM careers in adulthood. This gap is particularly concerning as STEM careers offer significantly higher labour-market returns compared to fields such as health or education where women are overrepresented. Strikingly, these disparities persist despite widespread agreement that women have the same capacity for science and technology as men.

Latin American and Caribbean countries have taken steps to promote equitable career guidance and challenge gendered career expectations. Programmes such as Chile’s Programa de Orientación Vocacional y Laboral, Argentina’s Educación para el Trabajo y la Ciudadanía, and Mexico’s Impulsa STEM initiative have sought to broaden career exploration opportunities, particularly for girls. These initiatives have demonstrated the importance of early and sustained exposure to career options, helping children and adolescents – especially girls – envision themselves in diverse professions. Additionally, strong public-private collaboration has been instrumental in expanding access to role models, mentorship programmes, internships and industry partnerships. Brazil’s National Education Plan further illustrates how systematic policy frameworks can integrate career guidance into national strategies to promote educational equity and workforce inclusion.

Building on these lessons, policymakers must continue to strengthen career guidance systems that challenge gender stereotypes and expand access to high-quality employment pathways. Investing in comprehensive, gender-responsive career guidance from an early age – combined with structured mentorship, industry engagement and targeted policy interventions – can help ensure that career choices are driven by interest and talent rather than entrenched social norms.

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5 Gender gaps in adult skills and labour market outcomes in Latin America and the Caribbean

This chapter examines the skills landscape in Latin American and Caribbean (LAC) countries, emphasising the importance of enhancing individuals' skills for economic growth. Drawing on data from the PIAAC Survey of Adult Skills (2011-2018) and the World Bank's STEP survey, it assesses the performance of men and women in LAC participating countries. Despite gains in educational access, substantial gaps in labour-market-relevant skills persist, limiting development. The chapter explores gender gaps in skills development and labour market outcomes, noting that while young women often outperform young men in reading, this does not lead to better job prospects. Moreover, highly skilled women face lower wages and returns on their literacy skills compared to men. By providing a broader perspective on the region's education and economy, the chapter contextualises gender-specific findings and stresses the need for ongoing efforts to close skill gaps and promote gender equality in the labour market.

Introduction

Skills transform lives, generate prosperity and promote social inclusion. Latin American and Caribbean (LAC) countries have faced economic challenges such as the 2008 global financial crisis, which have shown the importance of pairing short-term financial measures with broader structural reforms to support sustained growth. The 2008 crisis taught LAC that sustainable economic growth cannot be achieved merely through financial bailouts or monetary expansion. Instead, long-term progress hinges on equipping more people with better skills, allowing individuals to collaborate, compete and connect in ways that propel their own development and that of their countries. While access to formal education has expanded significantly across much of Latin America and the Caribbean in recent years, the region continues to struggle with substantial gaps in labour-market-relevant skills and knowledge. This persistent shortfall has become a key constraint on economic and social development, limiting opportunities for individuals and slowing progress at the national level.

Despite narrowing gender gaps across generations, women in Latin American countries participating in PIAAC continue to trail behind men in numeracy, with the proficiency gap among 16–24-year-olds in Chile and Peru measuring less than the OECD average. In Chile, for instance, while the numeracy gender gap among this age group has decreased significantly, it still falls below the OECD average of 10 points, indicating progress yet highlighting room for further improvement. Similarly, Peru demonstrates a reduced numeracy gap in younger generations, aligning closely with Chile's trends but still requiring targeted efforts to bridge disparities fully. These findings underscore the importance of sustained initiatives to promote gender parity in critical skill areas across the region.

Findings from international assessments indicate that individuals with weaker foundational skills are more likely to experience poorer health, perceive themselves as having little influence on political processes, and refrain from engaging in community or volunteer activities (OECD, 2023[1]). Human capital development is a crucial determinant of success for individuals and economies alike. Literacy and numeracy form the foundation for higher-order cognitive skills. And, as information and communications technology (ICT) permeates all aspects of life, being able to solve problems in technology-rich environments is becoming increasingly important.

Despite remarkable recent progress in educational attainment and enrolment, Latin American and Caribbean countries continue to lag in skill development among secondary-school students and the broader adult population. Young adults in the region face persistent challenges in the labour market and employers frequently cite skill shortages as a major barrier to business growth and productivity.

To better understand these gaps, this chapter draws on data from the first cycle of the OECD's Survey of Adult Skills as part of the Programme for the International Assessment of Adult Competencies (PIAAC) that was divided into three rounds of data collection (2011–2017) (OECD, 2019[2]; OECD, 2016[3]) to assess the performance of participating Latin American countries, with a focus on adult skill development from a gender perspective. It examines the average proficiency levels of men and women across the three skills measured by the survey, comparing their performance to other participating countries. The results are presented for the four participating Latin American countries: Chile (2014-15) and Ecuador, Mexico and Peru (2017). Additionally, data from the World Bank's Skills Towards Employability and Productivity (STEP) survey, which uses a shorter but comparable PIAAC literacy assessment to assesses the skill levels of adults in certain urban areas of Bolivia and Colombia (Box 5.1), are incorporated where relevant. While the STEP survey is not fully representative of the entire adult population of a country, these data provide critical insights into the region's skills landscape.

The region has seen significant gains in educational access, particularly among younger generations. As one can expect, data from the PIAAC Survey of Adult Skills show that young adults (aged 16–24) who have attended tertiary education perform better in this skills assessment than those who left school without completing upper secondary education. What is interesting is the fact that the skills gap between these groups is much wider in the region than the OECD average, reflecting the region's relatively recent expansion in upper secondary attainment (OECD, 2023[1]). As a result, skills in Latin America tend to increase more steadily inverse to age, meaning young adults are generally more skilled than older generations. This highlights recent improvements in educational access and attainment.

PIAAC data also indicate that gender gaps in skills development are narrowing across generations – although women in participating Latin American countries lag further behind men in numeracy than the OECD average, the gap is below the OECD average among 16–24-year-olds in Chile and Peru. Still, gender gaps in the labour market remain prevalent. Despite girls in Latin America and the Caribbean outperforming boys in reading in PISA in most countries, this has not translated into better labour market outcomes for women. And even though more highly skilled women at the top of the earnings distribution earn about the same as similarly skilled men in the Latin American countries participating in PIAAC, women in the region generally earn lower wages and have lower returns on their literacy skills than their male peers.

Before delving into the gender-specific analysis of adult skills development in the region, we first examine skills levels for the Latin American countries participating in PIAAC and STEP. This broader perspective contextualises the gender-specific findings and sheds light on the region's overall educational and economic landscape.

Box 5.1. Understanding PIAAC results and LAC participation in PIAAC

Overview of PIAAC domains and proficiency levels.

The results of the three assessed domains are reported using scales ranging from 0 to 500. Each of the three proficiency scales is divided into “proficiency levels”, defined by particular score-point ranges. Six proficiency levels are defined for literacy and numeracy (from below Level 1 to Level 5) and four for problem solving in technology-rich environments – PSTRE (from below Level 1 to Level 3).

The results for literacy and numeracy are presented in the form of mean proficiency scores for each country as well as the proportion of the population in each proficiency level. When it comes to assessing PSTRE, however, the share of the target population for which the results apply varies widely across countries/economies. This is due to the very different levels of familiarity with computer applications in the countries and economies participating in the Survey of Adult Skills. Proficiency scores relate only to the proportion of the target population in each participating country who were able to undertake the computer-based version of the assessment and thus meet the preconditions for displaying competency in this domain. In other words, the populations for whom proficiency scores for PSTRE are reported are not the same across countries. For this reason, the presentation of these results focuses on the proportion of the population at each proficiency level rather than comparing mean proficiency scores.

The proficiency levels are designed so that the scores represent degrees of proficiency in a particular aspect of the domain. Each level is associated with a certain number of items, with higher levels being associated with items of increasing difficulty. In other words, at each level, individuals can successfully complete certain types of tasks. For example, respondents scoring at Level 1 in literacy are likely to be able to successfully complete tasks that require reading relatively short texts to locate a single piece of information, which is identical to or synonymous with the information given in the question or directive and in which there is little competing information. Respondents reaching Level 5 in literacy are more likely to be able to complete tasks that involve searching for and integrating information across multiple, dense texts, constructing syntheses of similar and contrasting ideas or points of view, or evaluating evidence and arguments. These respondents can apply and evaluate logical and conceptual models and evaluate the reliability of evidentiary sources and select key information. They are also aware of subtle, rhetorical cues and can make high-level inferences or use specialised background knowledge.

The purpose of described proficiency scales is to facilitate the interpretation of the scores assigned to respondents. Respondents at a particular level have demonstrated knowledge and skills associated with that level and also those required at lower levels. Thus, respondents scoring at Level 2 are also likely to be proficient at Level 1, with all respondents expected to answer at least half of the items at that level correctly.

LAC participation in PIAAC

Four Latin American countries took part in the first cycle of PIAAC: Chile, Ecuador, Mexico and Peru. As middle-income countries, their results were lower than most other countries and economies taking part in the PIAAC survey. In literacy, numeracy and problem solving they were at or near the bottom of the rankings, and some did not have the basic skills necessary to take the assessment at all on a digital device, unsurprising in a region with low information and communications technology (ICT) penetration. More highly educated adults did better although even tertiary-educated adults in the Latin American participating countries demonstrated lower proficiency than the other participating countries. Skills in these countries tend to increase more steadily inverse to age, younger people having better skills, reflecting the very recent increases in upper secondary attainment. Gender gaps in skills are also wider among older age groups but narrower among the under-25s.

Source: (OECD, 2023[1]).

World Bank's Skills Towards Employability and Productivity (STEP) survey

STEP consists of two survey instruments that collect information on the supply and demand for skills – a household survey and an employers' survey. The household survey includes three unique modules to measure different types of skills: (a) Cognitive skills are defined as the "ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought". Cognitive skills are measured through self-reported surveys on literacy, numeracy and writing skills as well as an assessment of reading literacy based on PIAAC and designed to identify levels of competence at accessing, identifying, integrating, interpreting, and evaluating information; (b) Socio-emotional skills, sometimes referred to in the literature as non-cognitive skills or soft skills, which are measured by a battery of self-reported information on personality traits and behaviour (conscientiousness, extraversion, self-control, decision making, and aggressive behaviour) as well as risk and time preferences; (c) the use of job-relevant skills, which are measured by a series of questions on task-specific skills that the respondent possesses or uses in his or her job.

Data collection started in March 2012 for the first wave of countries in STEP. In this wave, household and employer surveys were implemented in some urban areas in Lao PDR, Sri Lanka, Ukraine, Viet Nam and Yunnan (province of China). In Bolivia and Colombia only the household survey was implemented. The second wave of implementation started in 2013. Both the household and employer surveys were implemented in Armenia, Georgia and Macedonia. The household survey alone was administered in Ghana and Kenya, and the employer survey alone was implemented in Azerbaijan.

The STEP target population is defined as all non-institutionalised persons 15 to 64 years of age (inclusive) living in private dwellings in some urban areas of the country at the time of data collection. This includes all residents except foreign diplomats and non-nationals working for international organisations. In Bolivia, the survey was conducted in urban areas of the following cities: La Paz, El Alto, Cochabamba and Santa Cruz de la Sierra. In Colombia, the survey was conducted in 13 metropolitan areas of the country: Bogotá, Medellín, Cali, Barranquilla, Bucaramanga, Cúcuta, Cartagena, Pasto, Ibagué, Pereira, Manizales, Montería, Villavicencio.

Source: (World Bank, 2014[4]).

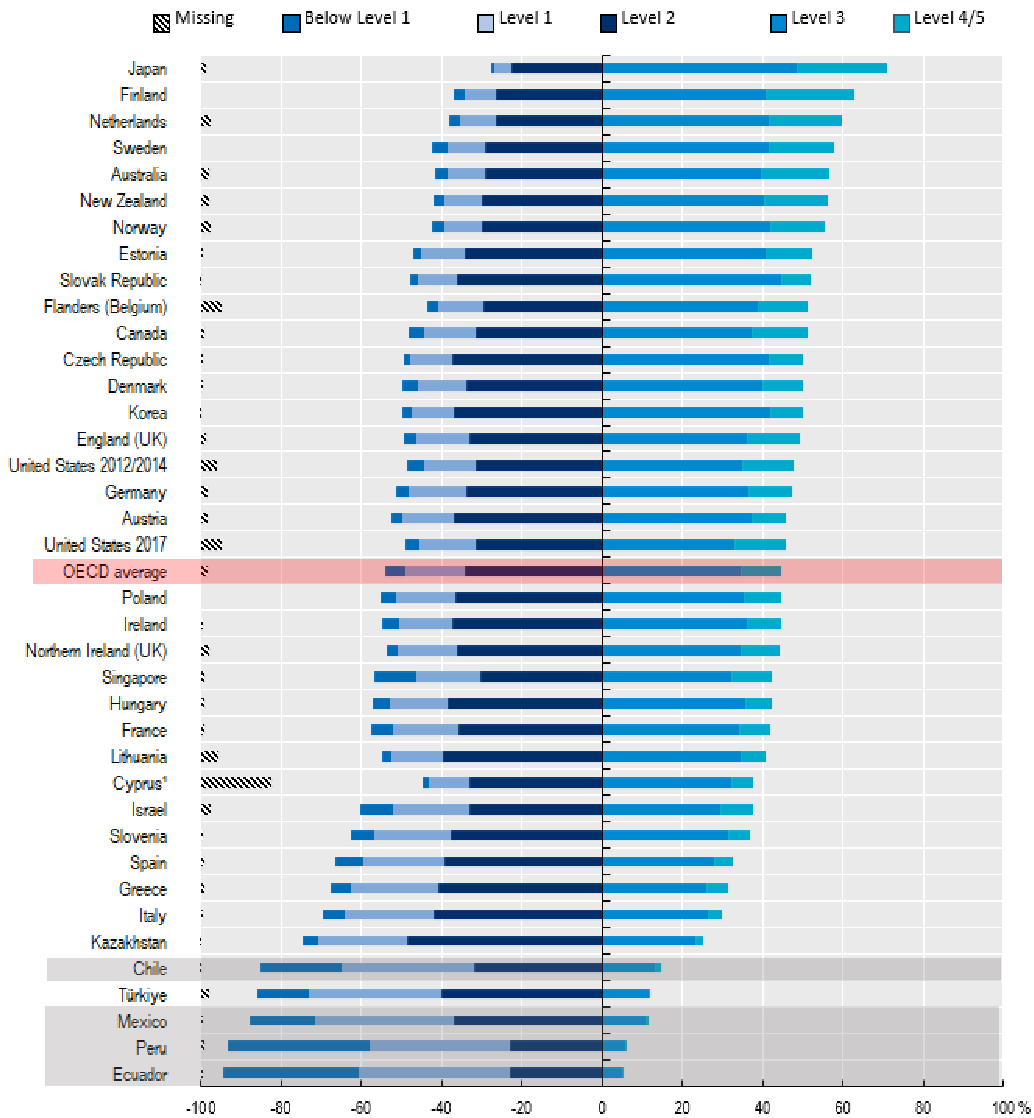
Adult literacy proficiency in Latin American countries in PIAAC

Across OECD participating countries, nearly half of all adults (44.6%) scored at Level 3 or higher in literacy proficiency. However, in the participating Latin American countries, significantly fewer adults reach these levels. Only 5.2% of adults in Ecuador, 11.7% in Mexico, and 6.1% in Peru achieve Level 3 or higher, while Chile performs slightly better at 14.5% (OECD, 2024[5]). These countries also exhibit some of the highest shares of adults scoring at Level 1 or below: Ecuador (71.2%), Peru (70.2%), Chile (53.4%) and Mexico (50.6%) (Figure 5.1).

The average literacy score across OECD countries is 266 points but the participating Latin American countries assessed fall well below this benchmark. Adults in Mexico scored an average of 222 points, in Chile 220 points, and in Peru and Ecuador just 196 points. These scores reflect persistent challenges in improving literacy outcomes despite recent gains in educational attainment (Figure 5.1) (OECD, 2023[6]).

Figure 5.1. Literacy proficiency among adults, PIAAC Cycle 1

Percentage of adults scoring at each proficiency level in literacy.



Note: Adults in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties or learning or mental disabilities (referred to as literacy-related non-response).
Source: (OECD, 2019[2]).

Besides differences in average literacy proficiency, it is also useful to explore differences in the distribution of scores within each country or economy. This can be done by identifying the score below which 5%, 25%, 75% and 95% of adults perform. Comparing score-point differences among adults at different points in the distribution of proficiency measures the extent of variation in that distribution in each participating country or economy. On average, across OECD countries, the gap between the top 25% and bottom 25% of adults in literacy scores – measured by the interquartile range – is 61 points. Among the Latin American countries that participated in PIAAC Cycle 1, Peru and Chile exhibit the largest disparities, with score gaps of 74 and 73 points, respectively. In Ecuador, the gap is 68 points, slightly above the OECD average, while in Mexico, it matches the OECD average at 61 points (OECD, 2023[1]).

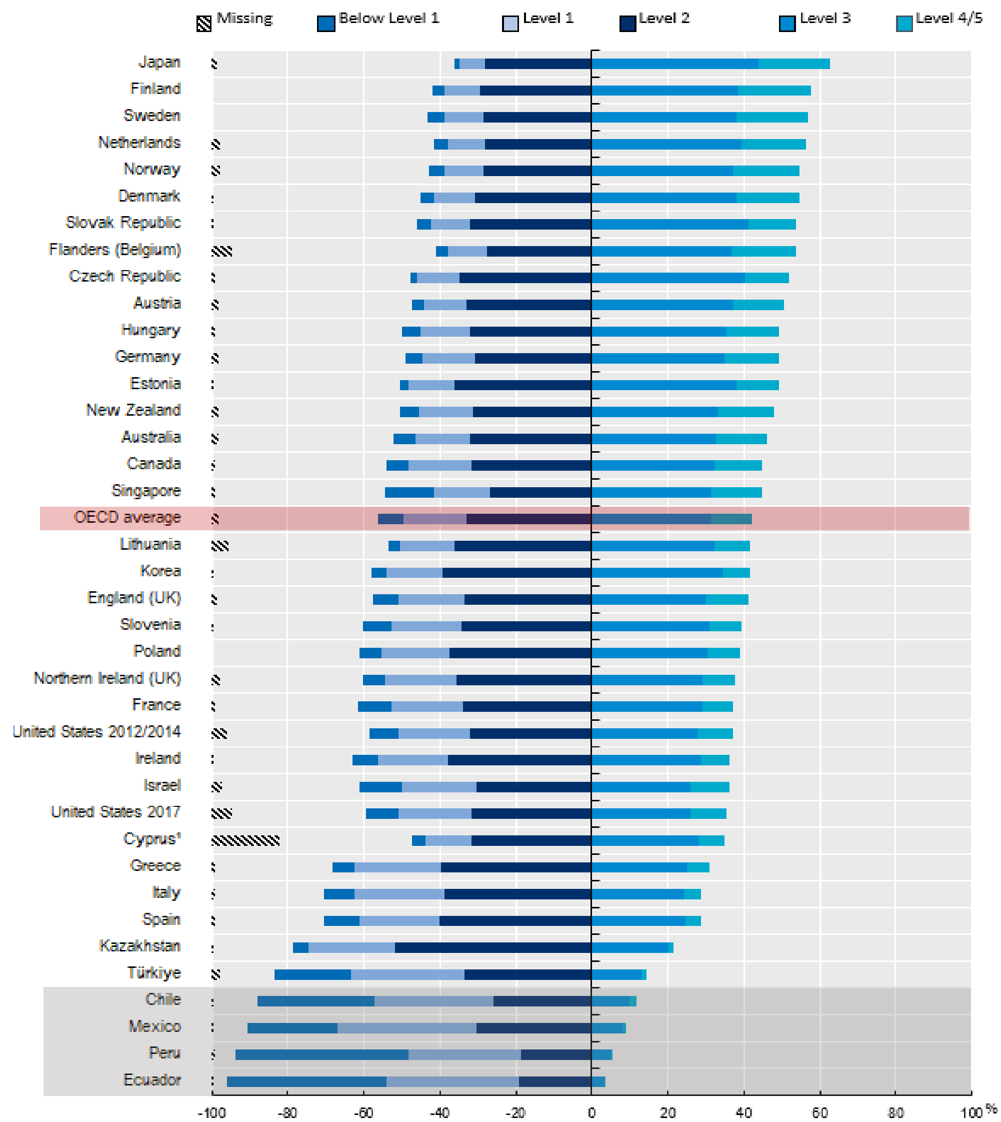
Adult numeracy proficiency in Latin American countries in PIAAC

On average, two in five adults (42.2%) across PIAAC-participating OECD countries/economies scored at Level 3 and above in numeracy. In the participating Latin American countries, much smaller shares of the adult population performed at this level: 11.9% in Chile, 3.6% in Ecuador, 8.9% in Mexico and 5.6% in Peru (OECD, 2024[5]). At the lower end of the scale, the share of adults scoring at Level 1 or below is alarmingly high, particularly in Ecuador (76.8%) and Peru (74.8%). Chile (61.9%) and Mexico (60.1%) also struggle with a large proportion of adults with weak numeracy skills (Figure 5.2).

The average numeracy score across OECD countries is 262 points but participating Latin American countries once again performed considerably worse: Peru (179 points), Ecuador (185 points), Chile (206 points), and Mexico (210 points). Additionally, the variation in numeracy proficiency within countries is stark. The difference in scores between the top and bottom quartiles is 91 points in Peru, 82 points in Chile and 74 points in Ecuador, all exceeding the OECD average of 68 points. These gaps highlight significant inequalities in skill distribution within countries (OECD, 2023[1]).

Figure 5.2. Numeracy proficiency among adults, PIAAC Cycle 1

Percentage of adults scoring at each proficiency level in numeracy



Note: Adults in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties or learning or mental disabilities (referred to as literacy-related non-response). Countries and economies are ranked in descending order of the combined percentages of adults scoring at Level 3 and at Level 4/5.
Source: (OECD, 2019[2]).

Proficiency in problem solving in technology-rich environments (PSTRE) in Latin American countries

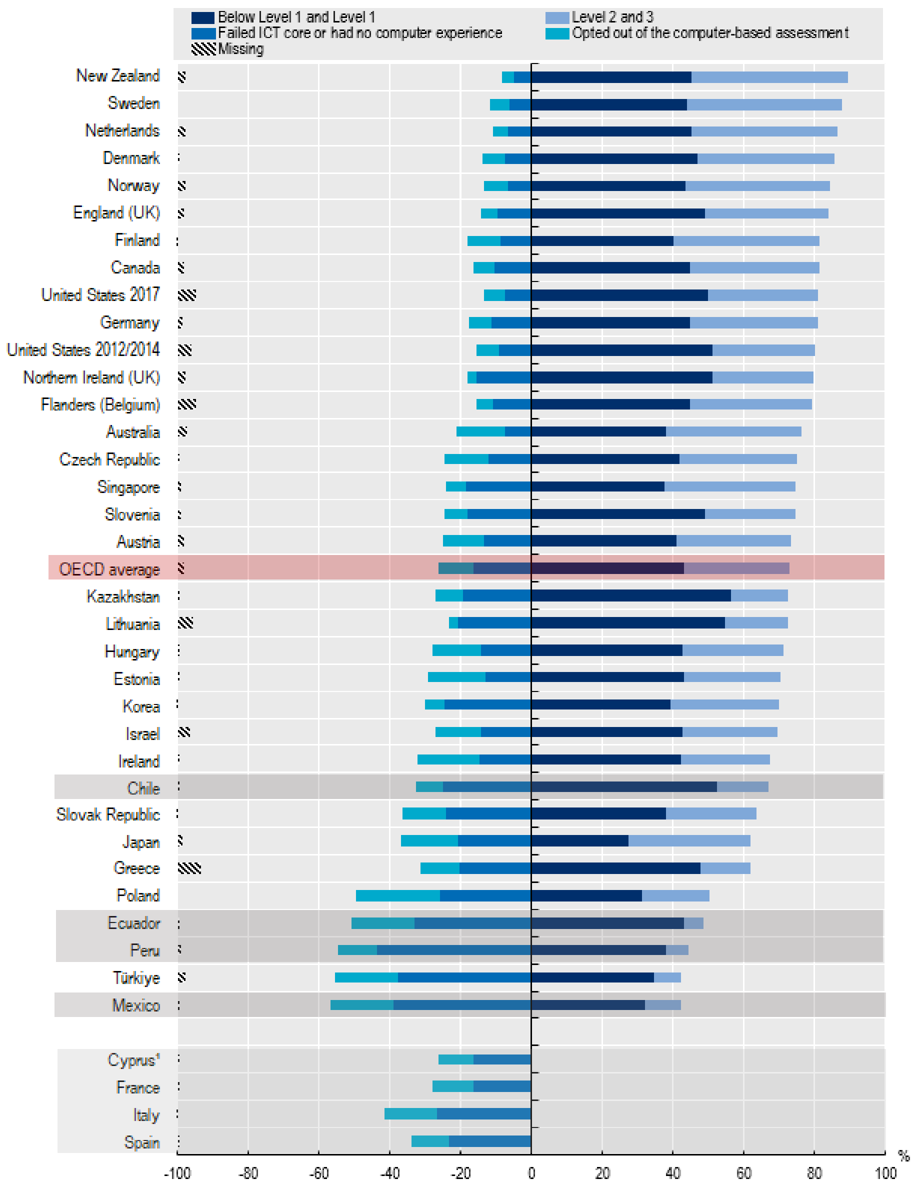
The PSTRE survey provides two key insights into adults' ability to navigate technology-rich environments. First, it identifies the proportion of adults who are sufficiently familiar with computers to use them for information-processing tasks. Second, it assesses the proficiency levels of those individuals in solving problems they are likely to encounter as workers, citizens and consumers in a digital world.

Nearly one-third of adults (29.7%) demonstrate proficiency in problem solving in technology-rich environments (PSTRE) at Level 2 or 3, the highest levels in this domain on average across OECD countries participating in the survey. Among the four Latin American countries participating in the survey, Chile has the largest proportion of adults performing at these levels (14.6%) while Mexico (10.2%), Peru (6.6%) and Ecuador (5.2%) have lower shares (OECD, 2023[1]).

At the other end of the spectrum, 43% of adults across OECD countries scored at Level 1 or below in PSTRE. Among participating Latin American countries, Ecuador has a similar proportion (43.1%) while Chile's share is nearly 10 percentage points higher (52.4%). In contrast, Mexico (32.1%) and Peru (37.8%) have smaller shares of adults scoring at Level 1 or below. Additionally, a significant portion of adults in these countries either lacked computer experience or did not meet the basic ICT skills required to take the computer-based assessment. As a result, their proficiency in PSTRE was not assessed, which may contribute to the lower reported shares at Level 1 or below (Figure 5.3).

Figure 5.3. Proficiency in problem solving in technology-rich environments among adults, PIAAC Cycle 1

Percentage of 16–65-year-olds scoring at each proficiency level.



Note: Adults included in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties or learning or mental disabilities (referred to as literacy-related non-response). The missing category also includes adults who could not complete the assessment of problem solving in technology-rich environments because of technical problems with the computer used for the survey. Cyprus, France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment. Countries and economies are ranked in descending order of the combined percentages of adults scoring at Level 2 and 3.
Source: (OECD, 2019[2]).

Across all participating countries, a considerable proportion of adults were unable to demonstrate proficiency in PSTRE due to taking the paper-based assessment. This group includes three subsets: (1) those with no prior computer experience, (2) those who failed the ICT core test, which assesses basic computer skills like using a mouse or scrolling through a webpage, and (3) those who opted for the paper-based test despite reporting ICT experience.

Aside from PSTRE scoring, an average of 11.7% of adults in PIAAC-participating countries reported having no computer experience and an additional 4.7% lacked the basic ICT skills required to take the computer-based assessment. The Latin American countries stand out for their high proportions of adults with no prior computer experience or poor ICT skills: Ecuador (32.9%), Mexico (39.2%) and Peru (43.6%) (OECD, 2023[1]).

These findings reflect broader disparities in economic development and digital access. Household computer ownership is relatively low in these countries - only 43.9% of households in Ecuador, 44.2% in Mexico and 33.6% in Peru had a computer in 2021 (ITU, 2021[7]). Internet access is also limited, with only about half of households in Ecuador (53.2%) and Peru (48.7%) having functional home Internet while Mexico's share is slightly higher (60.6%). In contrast, in many high-income OECD countries, over two-thirds of households have access to a computer, the Internet and a telephone line.

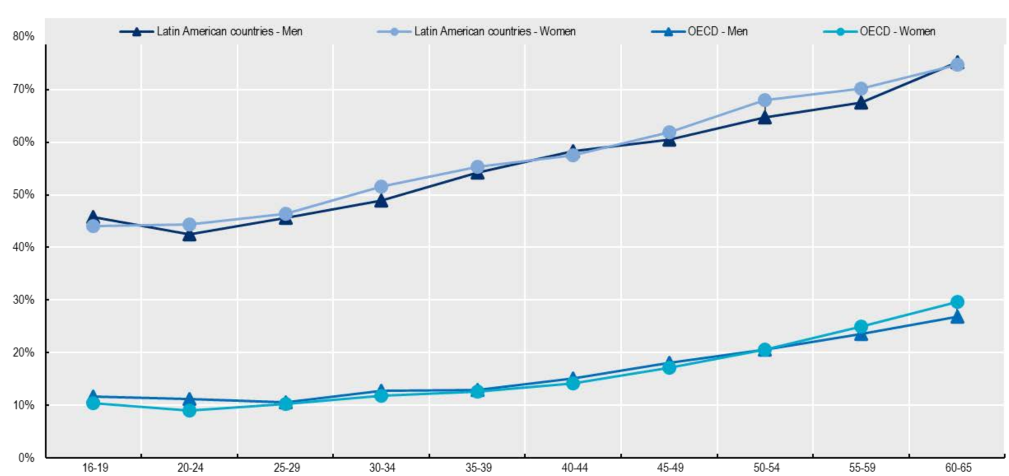
Additionally, some adults chose to take the paper-based assessment despite having prior computer experience. On average, 10% of adults in participating countries opted for this format. Among Latin American countries participating in the survey, Ecuador (18.1%) and Mexico (17.8%) have the highest shares of adults opting out of the computer-based assessment. Peru's share (11.1%) is close to the overall average while Chile has the lowest proportion (7.5%).

Skills proficiency and gender in Latin America

Basic skills and gender differences

Despite gains in schooling, many adults in Latin America lack essential reading skills, as we saw above, with little variation between men and women. Weak learning outcomes during childhood and adolescence likely contribute to poor adult literacy. Data from the first cycle of PIAAC for Chile, Ecuador, Mexico and Peru indicate that 59.5% of working-age adults (25–65 years) have low reading proficiency (scoring below Level 2). This proportion is about 3.4 times higher than the OECD average (Figure 5.4). Similarly, STEP data for Bolivia and Colombia show that 53.4% of adults have low reading proficiency. The gap between men and women is minimal: 59.3% of men and 60.1% of women scored below Level 2 compared to OECD averages of 17.6% and 17.7%, respectively (OECD, 2023[1]).

Figure 5.4. Low performers in reading among 25–65-year-olds, by gender and age group

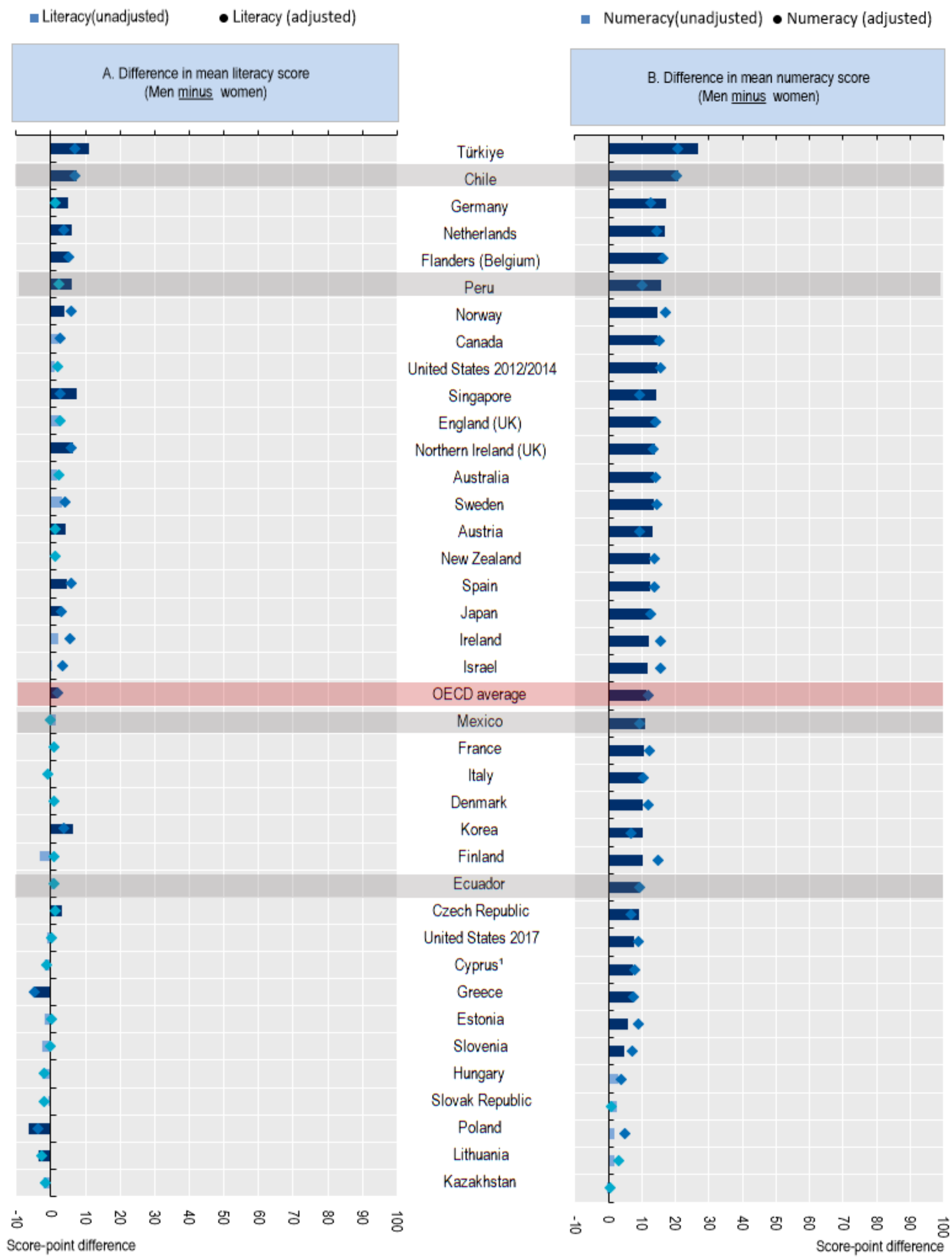


Note: Low performers are defined as those who score below Level 2 in reading. The LAC average is calculated only for PIAAC countries. The OECD average excludes Latin American countries.
Source: Survey of Adult Skills (PIAAC), for Chile, Ecuador, Mexico and Peru.

Gender gaps in skills proficiency vary by domain. Differences are generally smaller in literacy than in numeracy and Latin America follows this pattern. The gender gap in numeracy exceeds the OECD average of 11 score points in Peru (16 points) and Chile (21 points) (Figure 5.5).

Figure 5.5. Gender differences in literacy and numeracy proficiency, PIAAC Cycle 1

Differences in mean score between men and women



Note: Statistically significant differences are marked in a darker tone. Unadjusted differences are the differences between the two means for each contrast category. Adjusted differences are based on a regression model and take account of differences associated with other factors: gender, education, immigrant background, language and parents' educational attainment. Countries and economies are ranked in ascending order of the difference in numeracy scores (men minus women).

Source: (OECD, 2019[2]).

Additionally, literacy skills vary based on labour market status. PIAAC data show that 42.4% of employed adults in the Latin American sample have moderate literacy proficiency (at or above Level 2), which is about 43 percentage points below the OECD average of 85.9%. Unemployed and inactive adults in the region tend to be less proficient: only 41.1% of unemployed individuals and 34.9% of inactive ones have reading proficiency at or above Level 2. The data for the participating Latin American countries also reveal some small gender differences: 43.5% of employed women and 41.7% of employed men are proficient. Among the inactive, 34.4% of women and 36.9% of men scored at or above Level 2 (OECD, 2023[1]).

The skills profile of informal workers is particularly weak. In Bolivia and Colombia, 50% of informal workers scored below Level 2 in STEP's reading skills measure. Women tend to fare worse than men: in Bolivia, 69% of women and 67% of men in informal employment have low reading proficiency while in Colombia, 47% of women and 43% of men fall into this category.

Age and gender disparities in skills proficiency

Gender differences in literacy and numeracy are more pronounced among older adults. Two key factors explain this trend: (a) women's educational attainment has progressively caught up with men's, and (b) men and women continue to pursue different occupational paths, affecting opportunities to practice and maintain skills. In Peru and Chile, gender gaps in numeracy are among the highest across PIAAC participants for adults aged 25 and over (19 and 24 score points, respectively) but decline significantly among younger adults (5 and 8 score points, respectively) and is below the OECD average. This suggests that younger women have reached near-parity in education with men. However, among adults over 25, women still remain overrepresented among those without upper secondary education and underrepresented among those who have completed it (OECD, 2023[1]).

For adults aged 45 and over, gender gaps in numeracy are wider than the OECD average in Chile, Ecuador and Peru but are much smaller among younger adults. A similar pattern exists in Mexico although the gender gap among older adults is in line with the OECD average.

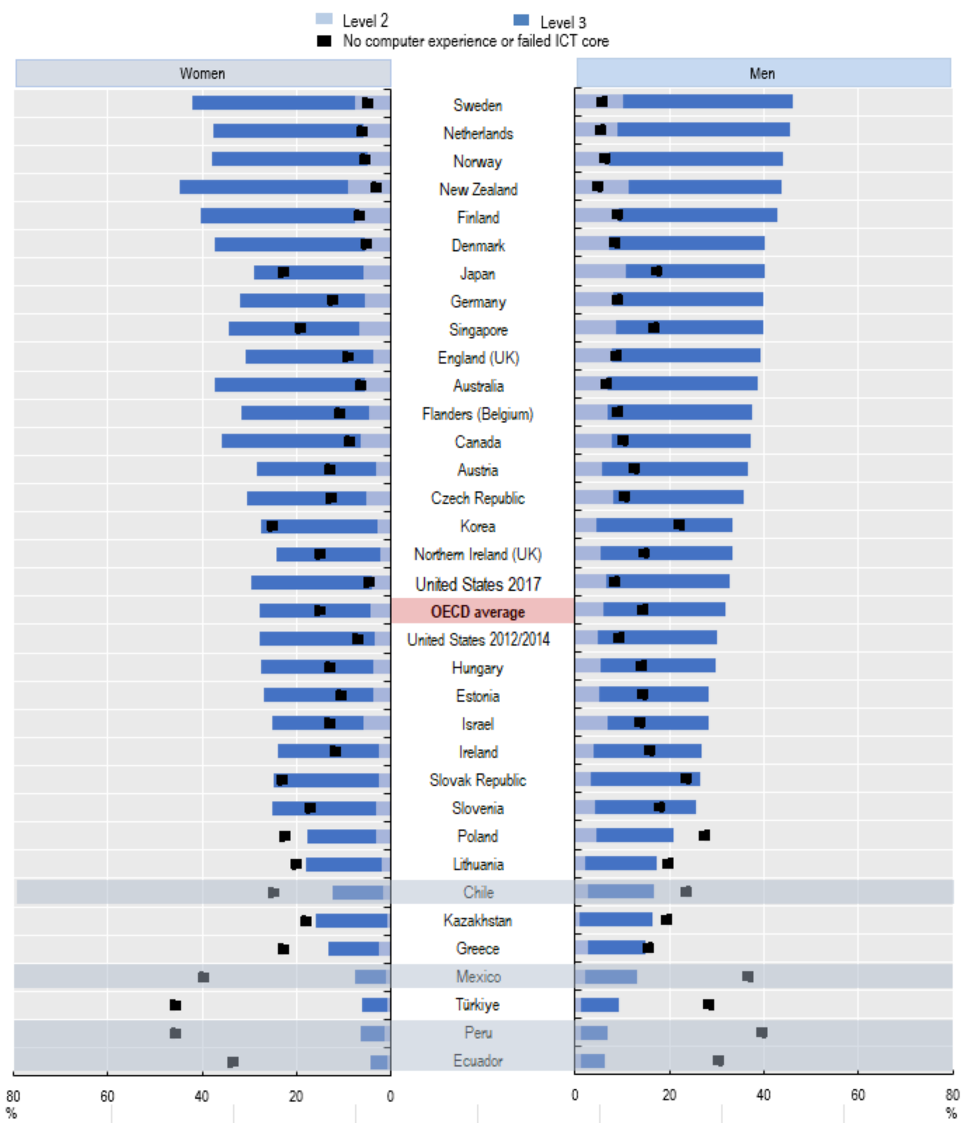
Gender gaps in problem-solving skills

Gender differences in problem solving in technology-rich environments (PSTRE) skills are less pronounced than in literacy and numeracy. On average across OECD countries, 32% of men and 28% of women scored at Level 2 or 3 in PSTRE. Similarly, in Latin American countries participating in PIAAC, gender gaps at the highest proficiency levels remain small. In Ecuador, 6% of men and 4% of women scored at Levels 2 or 3 while in Peru, 7% of men and 6% of women reached these levels (OECD, 2023[1]). The gap is slightly wider in Mexico (13% of men vs. 8% of women) and Chile (17% of men vs. 12% of women) (Figure 5.6).

At the lower end of the distribution, more women than men lack basic ICT experience or fail the ICT core test in Ecuador and Peru. In Ecuador, 35% of women fall into this category compared to 31% of men while in Peru, the figures are 47% for women and 41% for men. In contrast, gender differences are smaller in Chile and Mexico where 26% of women and 24% of men in Chile, and 41% of women and 38% of men in Mexico, reported having no computer experience or failing the ICT core test (OECD, 2023[1]).

Figure 5.6. Problem-solving proficiency among men and women, PIAAC Cycle 1

Percentage of women and men scoring at Level 2 or 3 in problem solving in technology-rich environments or having no computer experience



Note: Percentages for the problem solving in technology-rich environments scale are computed so that the sum of percentages for the following mutually exhaustive categories equals 100%: opted out of the computer-based assessment; no computer experience; failed ICT core test; below Level 1, Level 1, Level 2 and Level 3. For more detailed results for each category, see the corresponding table mentioned in the source below. Cyprus, France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment. Countries and economies are ranked in descending order of the combined percentages of men scoring at Level 2 or 3.

Source: (OECD, 2019[2]).

Gender differences in labour market outcomes with a focus on STEM careers

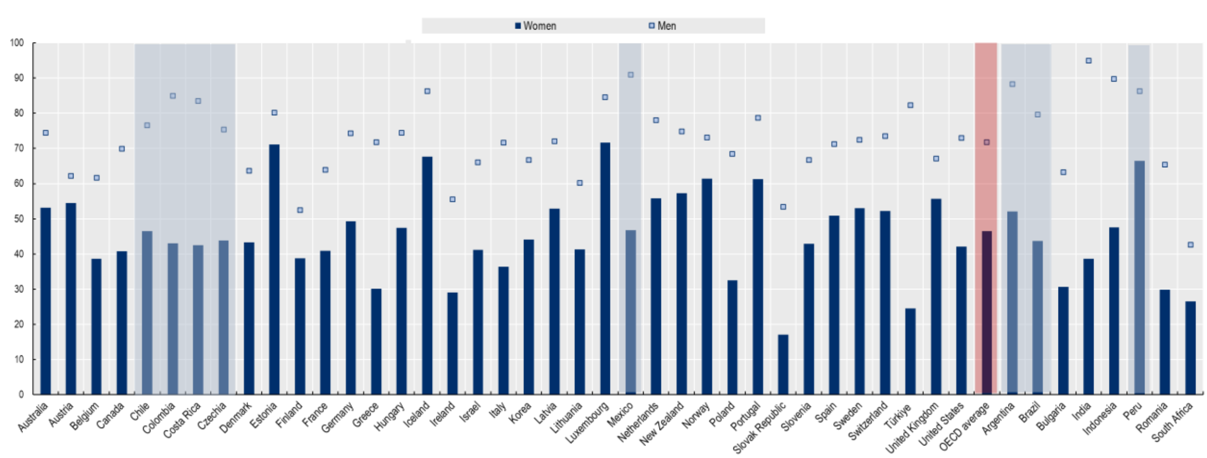
It is widely documented that those with higher qualifications are more likely to find employment (Card, 2001[8]; Harvey, 2000[9]; Pages and Stampini, 2007[10]). While employment opportunities do exist for individuals with lower qualifications, their overall labour market prospects remain relatively limited. People with the lowest educational qualifications have lower earnings and often work in routine jobs that are at greater risk of being automated, therefore increasing their likelihood of being unemployed (Arntz, Gregory and Zierahn, 2016[11]),

Education at a Glance (EAG) data show the employment rate for adults (25–64-years-old) without upper secondary education across OECD countries averages 60%, rising to 77% for those whose highest attainment is upper secondary or post-secondary non-tertiary education – a 17-percentage-point increase. Tertiary education further boosts employment rates by an additional 10 percentage points, reaching 87% on average. However, in Latin American countries, the employment advantage of attaining upper secondary or post-secondary non-tertiary education is generally lower than in OECD countries. Only in Brazil is the gap comparable to OECD levels, with a 15 percentage-point difference in employment rates between those with and without upper secondary education. In contrast, the employment premium is less than 10 percentage points in Colombia, Costa Rica, Mexico, Argentina and Peru (OECD, 2024[5]).

Among young adults aged 25–34 without upper secondary attainment, gender disparities are particularly stark (Figure 5.7). On average across OECD countries, 47% of women aged 25–34 without upper secondary attainment are employed compared to 72% of their male peers, creating a 25-percentage-point gender gap. This gap is even wider in many Latin American countries, with employment rates for young men in Chile, Colombia, Costa Rica, Mexico, Argentina and Brazil exceeding those of young women by 30 to 44 percentage points. Peru stands out as an exception, where the gender gap is lower than the OECD average: 66% of women aged 25–34 without upper secondary attainment are employed compared to 86% of men – a 20 percentage-point gap. This suggests that women with lower educational qualifications have relatively better employment prospects in Peru than in other Latin American countries (OECD, 2024[5]).

Figure 5.7. Employment rates of 25–34-year-olds with below upper secondary attainment, by gender (2023)

Percentage of employed 25–34-year-olds among all 25–34-year-olds



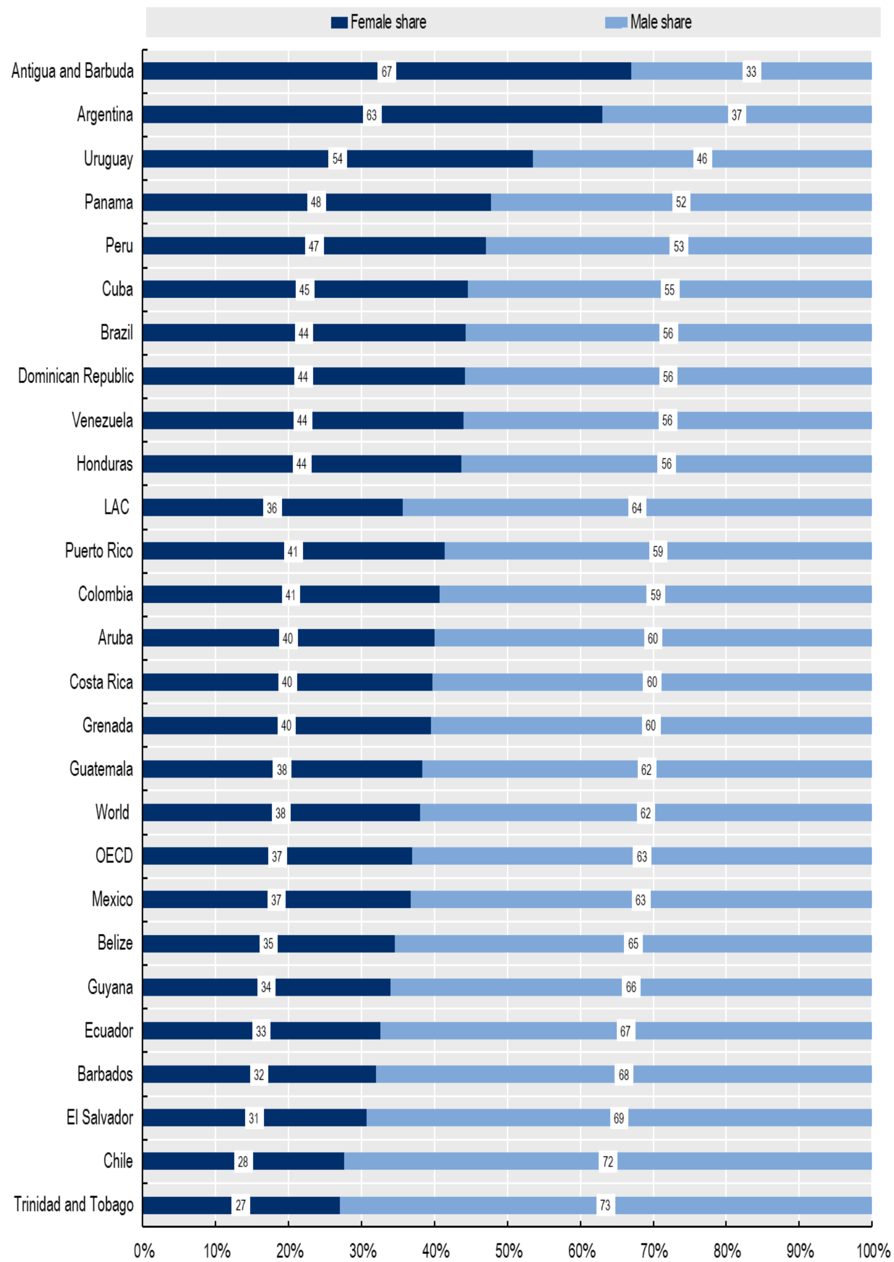
Source: (OECD, 2024[5]).

The above-mentioned inequalities persist despite girls outperforming boys in reading and performing only marginally behind boys in mathematics, as seen in PISA assessments (OECD, 2023[6]). A key contributor to this disparity is the divergence in career aspirations, which often translates into future occupational choices. According to PISA 2022 data, only a small minority of girls in LAC countries (between 5 and 19%, depending on the country) reported that they expect to work in a STEM-related occupation. Boys are more than twice as likely as girls to report this expectation in most of the LAC countries. The gender gap in expectations is especially large in LAC countries like Colombia, Peru, Costa Rica and Dominican Republic, where boys are over 15 percentage points more likely than girls to report that they expect to pursue a career in a STEM-related occupation. It follows that, in LAC, only around 4 out of 10 graduates in STEM are women, varying widely across countries. Interestingly, LAC fares slightly better than the world and the OECD averages (38% and 37%, respectively) in terms of female STEM graduates (Figure 5.8).

Looking beyond STEM education to STEM employment outcomes, evidence points to even wider gender gaps. Women are underrepresented in science and engineering occupations (70.2% men) but overrepresented in occupations like in health (71.4% women) and education (62.5% women). The gender gap is even more pronounced in the information and communication technologies (ICT) sector where women account for only 30% of workers, with wide variation across countries – from 42% in Guyana to just 22% in Argentina. LinkedIn economic data show that men are roughly twice as likely as women to work in STEM occupations in Argentina, Brazil, Chile, Mexico and Peru (WEF, 2024[12]) CEDLAS household surveys also show that in most LAC countries, fewer than one in five women aged 30–40 is employed in STEM fields while the share for men is two to three times higher (Berniell, Fernández and Krutikova, 2025[13]). Countries like Chile, Colombia, Mexico and Peru exhibit the largest gaps, reflecting disparities that begin in adolescence (see Chapter 4 for graphs). This disparity is not unique to the region but reflects a global trend: on average, women only hold 28% of positions in science and engineering fields (UNESCO, 2017[14]).

Figure 5.8. Share of graduates in STEM careers by gender in LAC countries

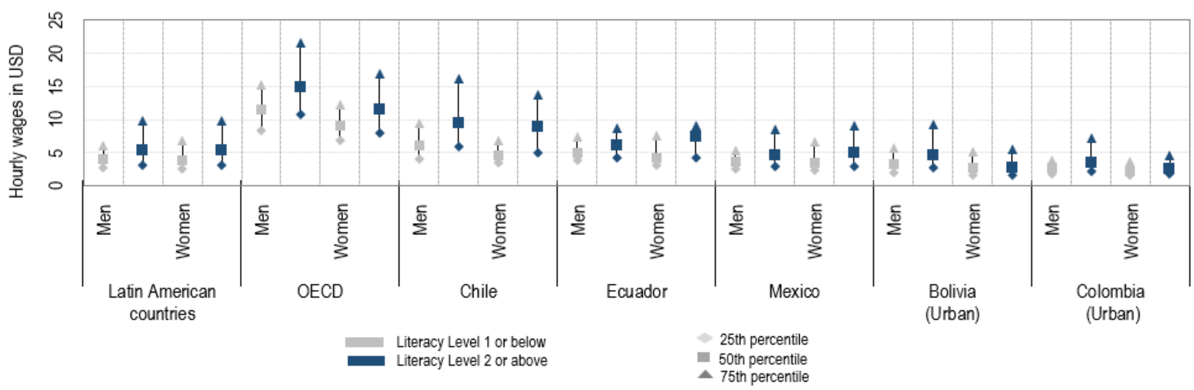
Share of graduates in STEM careers by gender (%).



Note: The shares represent the average participation of men and women in STEM-related graduate fields, encompassing engineering, manufacturing, construction, natural sciences, mathematics, statistics, science and technology. The regional average is calculated as a simple average of values from countries in Latin America and the Caribbean (LAC). The averages for OECD countries and the world are computed similarly.
Source: World Bank's Gender Data Portal, based on data collected by the UNESCO Institute for Statistics.

Earnings data reinforce these inequalities. In OECD countries, highly skilled women in literacy (PIAAC Level 2 or above) in the top earnings quartile earn 22% lesser than equally skilled men (Figure 5.9). In contrast, highly-skilled women in the top earnings quartile earn about the same as similarly skilled men in the Latin American countries participating in PIAAC and STEP. However, there are significant variations across countries: in Chile, the pay gap is 15%, while in urban Bolivia and Colombia, it reaches 40% and 37%, respectively. Mexico is an outlier where highly-skilled women earn 6.4% more than their male counterparts.

Figure 5.9. Distribution of hourly wages among 25–65-year-olds, by literacy proficiency and gender



Note: The data are based on gross hourly earnings of full-time wage and salary workers (30 hours or more per week) aged 25 to 65 expressed in purchasing-power-parity-adjusted USD (2012). The wage distribution was trimmed to eliminate the 1st and 99th percentiles. The first plausible value was used for determining the proficiency level. The LAC average is calculated only for PIAAC countries. The OECD average excludes Latin American countries.
Source: OECD, Survey of Adult Skills (PIAAC), for Chile, Ecuador, Mexico and Peru, and World Bank, STEP Skills Measurement Program, for Bolivia and Colombia.

Returns on reading skills in LAC are estimated at 5.8%. This is below the OECD average of 7.9%. The returns are slightly higher for men (6.1%) than for women (5%). Country-level analysis suggests that an increase in literacy proficiency by one standard deviation boosts women's earnings by 5.7% in Ecuador and 10% in Chile. For men, the impact ranges from 6.2% in Ecuador to 15.6% in urban Bolivia (OECD, 2023[1]).

Even when women graduate from STEM programmes, their transition into related employment is constrained by workplace discrimination, caregiving responsibilities and lack of flexible working arrangements (Beede et al., 2011[15]). In LAC, unpaid care work is estimated to account for 21.4% of GDP, significantly higher than the OECD average of 15%. Women bear the brunt of this burden, performing 74% of unpaid care work in most LAC countries compared to 66% in OECD countries (UNDP, 2024[16]).

The underrepresentation of women in STEM fields has far-reaching implications. STEM careers are among the fastest-growing and highest-paying occupations globally. The continued underutilisation of female talent in these areas not only limits women's economic opportunities but holds back the region's overall productivity and growth potential. Increasing the number of STEM jobs and fostering a more diverse workforce could meaningfully accelerate economic performance in LAC, especially given the strong association between STEM occupations, higher wages and labour productivity. Addressing gender disparities in STEM employment requires early and sustained interventions (see Chapter 6). These include tackling stereotypes, strengthening school-level guidance systems, showcasing successful female STEM professionals, and ensuring that workplace environments are inclusive, flexible and supportive of women's career development.

Conclusion

In conclusion, the integration of women into STEM fields and the effective utilisation of their skills remain pivotal to addressing the persistent gender disparities in the labour market. The evidence presented highlights the multidimensional challenges faced by women, from wage inequalities and caregiving responsibilities to workplace discrimination and limited access to flexible arrangements. These barriers significantly constrain the transition of female graduates from STEM programmes into relevant employment, thereby undermining the productivity potential of the labour market, particularly in Latin America and the Caribbean (LAC).

Data from PIAAC further underscore the critical role of literacy and other foundational skills in influencing earnings. Returns on literacy proficiency demonstrate substantial variations across countries, with notable gender differences that persist despite high levels of skill attainment. For instance, while returns on literacy skills for men in urban Bolivia reach 15.6%, women in the same context experience significantly lower impacts. This underscores the necessity of creating equitable labour market structures where both men and women can fully leverage their competencies.

STEM careers, characterised by their high growth potential and association with elevated wages, represent a crucial opportunity for enhancing labour market outcomes. However, the underrepresentation of women in these fields has far-reaching implications, not only for gender equality but also for national economic performance. The unparalleled growth potential of STEM occupations calls for targeted interventions to eliminate the barriers that hinder women's participation and success in these sectors.

Addressing these challenges demands a comprehensive and sustained policy approach. Investments in skill development, as well as initiatives to tackle stereotypes and promote inclusive workplace practices, are essential. Moreover, educational systems must prioritise early interventions, reinforced by guidance systems that inspire and prepare young women for STEM careers. By fostering an equitable and diverse workforce, the region can unlock its full economic potential, leveraging both the human capital of its population and the transformative power of skills in the labour market.

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6 Gender gaps in STEM education and careers in LAC: Understanding the barriers and policy messages for shaping inclusive pathways

Chapter 6 explores the various barriers that girls and women face in pursuing education and careers in science, technology, engineering and mathematics (STEM) in Latin America and the Caribbean (LAC). The chapter discusses how social and gender norms, stereotypes, and biased beliefs impact educational choices and career paths. It highlights the significant role of parents, educators and peers in shaping these decisions. Furthermore, it examines the phenomenon of the "leaky pipeline," where women are more likely than men to leave STEM fields at various stages of their educational and career journeys. The chapter also addresses the barriers women encounter in tertiary education and the workplace, including limited access to career guidance, insufficient awareness of opportunities in STEM, and the challenge of horizontal segregation. Finally, it emphasises the need for targeted policies to support girls and women in STEM, fostering a more inclusive environment that encourages their participation and success.

Introduction

The underrepresentation of women in science, technology, engineering and mathematics (STEM) careers is frequently described as a “leaky pipeline.” From secondary school through to university and on to employment in STEM, this pipeline leaks students at various stages: students who express interest in science careers sometimes change their minds when applying to colleges and universities and select other areas of study. Others begin their post-secondary education in a STEM programme but change majors before graduation. Finally, some students leave the pipeline after graduating with a STEM degree but go into another field as a career. One interesting feature of these leaks is that women leak out more than men do. The effect of differential leaking is to create a sex-based filter that removes one sex from the stream and leaves the other to arrive at the end of the pipeline (Blickenstaff, 2006[1]).

This pattern persists despite evidence that girls often perform as well as or better than boys in mathematics and science during their primary and secondary education. Yet, as seen in Chapters 4 and 5, few women continue to graduate programmes in STEM or enter STEM professions, particularly in technology and engineering. Furthermore, women in STEM face significant barriers to career progression and rarely occupy high-ranking research positions, a trend often referred to as “horizontal segregation.”

The 2022 Programme for International Student Assessment (PISA) reveals only minimal average score differences between girls and boys in science and mathematics – on average across OECD countries, boys outperformed girls by nine points in mathematics while the performance difference in science between boys and girls is not significant (OECD, 2023[2]). However, career expectations remain sharply divided as more boys expect to pursue engineering careers: PISA 2022 results show that only 16% of 15-year-old girls who are top performers in science or mathematics (achieved Level 4 proficiency or higher in either mathematics or science in PISA 2022) reported that they expect to work as professionals in science or engineering while 22% of top-performing boys the same age did, on average across OECD countries (OECD, 2024[3]). This discrepancy reflects the outsized role of social factors in shaping education and career decisions.

The transition from school to work further reveals these disparities. Limited access to career guidance and insufficient awareness about opportunities in STEM and other traditionally male-dominated sectors can discourage young women from pursuing these career paths. Gender gaps also persist among STEM teaching staff in higher education across Latin America and the Caribbean, reinforcing the cycle

Girls and women face specific barriers to STEM fields and careers that fall into three stages: (a) throughout the lifecycle of education (b) at tertiary education, and (c) in the workplace.

Throughout the lifecycle of education

Biased beliefs about boys' and girls’ aptitude

In the 81 countries and economies that participated in PISA 2022, girls reported more often and to a larger extent than boys, fear of failure (OECD, 2024[4]). PISA reveals that self-efficacy (the extent to which students believe in their own ability to solve specific mathematics tasks) and self-concept (students’ beliefs in their own mathematics abilities) are much more strongly associated with performance among high-achieving than low-achieving students. Still, at every level of performance, girls tend to have much lower levels of self-efficacy and self-concept in mathematics and science.

Experiencing stereotypes over the long term can lead women to distance themselves from STEM (Diekman, Clark and Belanger, 2019[5]). And attitudinal differences often stem not from innate ability but differences in how girls and boys are treated or perceived in different countries. In OECD countries, boys reported more positive attitudes and confidence in STEM subjects whereas girls often reported lower self-efficacy. However, this pattern reverses in some Middle Eastern and Central Asian countries where girls score higher and express more interest and confidence in STEM (UNDP, 2024[6]).

Such differences underscore the importance of external environments – such as parental expectations, teacher perceptions and cultural narratives – in shaping girls' STEM outcomes (LaCosse et al., 2021[7]). Persistent gender biases, whether conscious or unconscious, affect how teachers and parents view STEM aptitude. These views can dampen girls' motivation, self-belief and performance. Biases may even influence the way STEM subjects are introduced and the kinds of opportunities made available to girls (Benavot, 2016[8]; Rabenberg, 2013[9]; Vedder-Weiss and Fortus, 2013[10]).

Academic streaming

The academic streaming process adds another layer of complexity. In many countries, high-school students are required to choose between science and liberal arts tracks. Since science tracks are typically more competitive, students who lack confidence – particularly girls – may avoid them altogether. Girls who are not actively encouraged to compete or who show uneven performance in math and science subjects may opt out of STEM pathways as early as age 15. By funnelling students into specific fields through academic streaming, the ability of women to pursue STEM-related education and careers is further affected. Academic streaming perpetuates gender-based filtering that contributes to the leaky pipeline. This limits women's participation in STEM education and careers.

Teaching methods and teachers' perception

Teachers' gender stereotypes can influence girls in such a way that they underperform in math and self-select into less demanding high schools (Carlana, 2019[11]). There is also research from Thailand and China showing that teachers who believe boys outperform girls in math often see poorer performance from their female students (Jitkaew, 2019[12]).

Teachers not only shape academic achievement but also play a key role in motivating interest in STEM fields. High-quality teaching, particularly by female educators who serve as role models, can counter gender stereotypes and foster more equitable classroom environments (Ekmekci and Serrano, 2022[13]). Training teachers to understand their own bias is important.

Moreover, the representation of gender roles in school textbooks can reinforce harmful stereotypes about STEM competence. When textbooks portray men in scientific or technical roles while ignoring women's contributions, they signal to students that STEM is a male domain, discouraging girls from pursuing such careers (Benavot, 2016[8]).

Accessing information on STEM careers

Another important factor influencing career decisions is access to information about STEM fields. Many students – especially girls – lack adequate guidance and exposure to the full range of STEM careers. Without role models or real-world applications to connect with, girls may find STEM subjects unrelatable and opt for other paths. The challenge is even greater in rural areas where limited resources, fewer qualified teachers and lack of extracurricular opportunities further constrain access to STEM education.

Efforts to counter this must begin early and involve all stakeholders – families, educators and policymakers. Interventions must challenge gender stereotypes, incorporate gender-responsive teaching practices and improve access to STEM resources in underresourced settings. Promoting diverse role models, redesigning curricula to be inclusive and relevant, and providing accurate information about STEM careers can help retain more girls in the STEM pipeline and reduce the gender gap in these critical fields.

Structural and social barriers to STEM participation in university

According to PISA 2022, only a small minority of girls in LAC countries (between 5 and 19% in most countries) reported that they expect to work in a STEM-related occupation (such as science, engineering or ICT-related professions). Boys are more than twice as likely as girls to report this expectation in most of the LAC countries. The gender gap in expectations is especially large in LAC countries like Colombia, Peru, Costa Rica and Dominican Republic where boys are over 15 percentage points more likely than girls to report that they expect to pursue a career in a STEM-related occupation (OECD, 2024[4]). Even when girls pursue STEM education, their career preferences often diverge: girls are more likely to be drawn to biology and healthcare while boys gravitate toward engineering and technology (OECD, 2015[14]). Moreover, girls are often overrepresented in terms of their aspirations in currently women-dominated occupations, including personal care, health and teaching, and underrepresented in male-dominated occupations, like information and communication technologies and the trades (OECD, 2024[4])

As seen in the previous chapter, some progress has been made in Latin America and the Caribbean where women now represent 40% of STEM tertiary graduates (UNDP, 2024[15]). However, within the STEM field, women are least represented in engineering, industry and construction, where women's college enrolment stood at 30.8% in 2019 (ECLAC, 2022[16]). This proportion is even lower in ICT areas: in Brazil only 15% of ICT graduates are women; in Chile, 13%; Costa Rica, 20%; Uruguay, 18% (ECLAC, 2022[16]). Other challenges also play a role: persistent gender gaps in mathematics and science performance at the secondary level in the region, exclusionary academic environments, scarcity of visible female role models in science, and influence from peers and family members. Even women who complete tertiary STEM education often face new hurdles when entering the workforce, such as inflexible work arrangements or male-dominated work environments. These can influence women's decisions to drop their careers in STEM.

Lack of information about technical and vocational education

While most STEM careers require postgraduate education, alternative tracks – such as associate degrees, technical education and vocational programmes – can offer more accessible and inclusive routes into the field. Careers in programming, digital applications development, or e-commerce, for instance, provide valuable entry points without the need for advanced degrees. However, women and girls are often unaware of these pathways because of entrenched gender stereotypes. Many are simply not informed about vocational or apprenticeship options that could expand their access to STEM-related careers. Addressing these knowledge gaps and challenging stereotypes is essential to opening a broader range of opportunities for women in STEM.

In the workplace

Cultural stereotypes and limited career aspirations

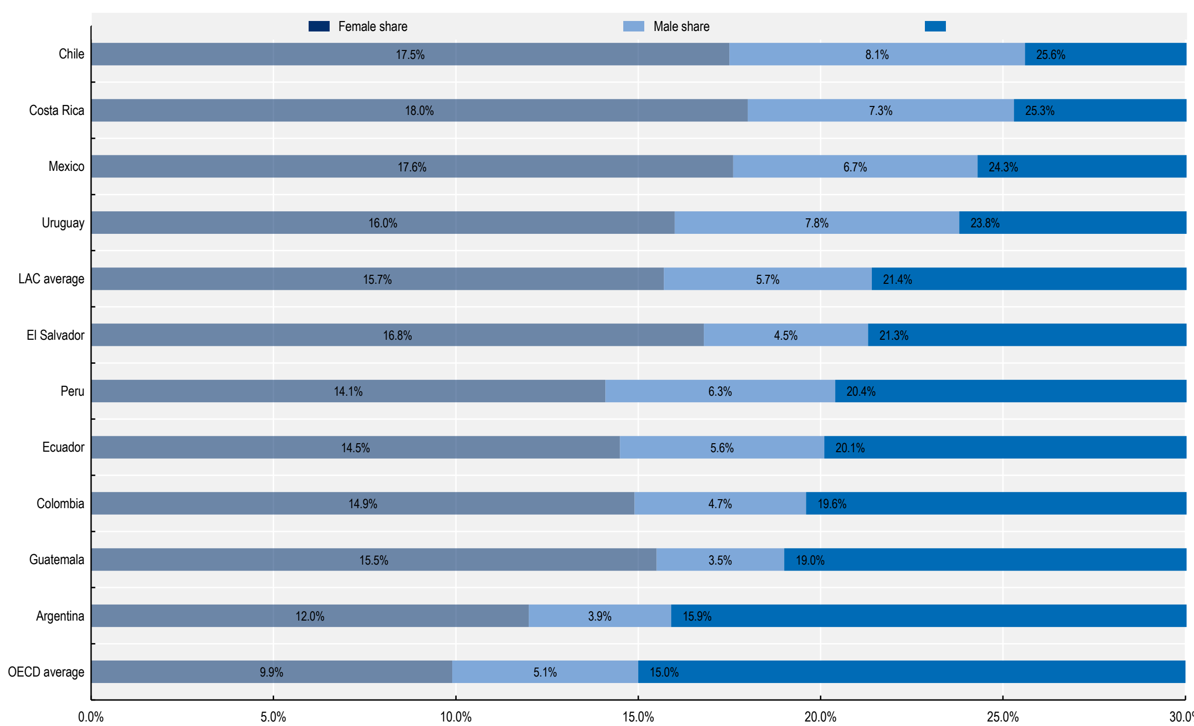
Deep-seated cultural norms – often reinforced by families, educators and the media – imply that women are less suited for STEM careers or require more flexible work arrangements to accommodate caregiving responsibilities. These implicit biases can influence recruitment, performance evaluations and promotion decisions, often limiting women's opportunities despite formal commitments to meritocracy. For example, a survey in China conducted in 2022 revealed that over 60% of women were questioned about their marital status and plans to have children during job interviews (Zhaopin, 2023[17]).

These biases not only affect employers' perceptions of women but influence how women perceive their own potential. In male-dominated STEM environments, women frequently hold themselves to higher standards than their male counterparts and are more likely to underestimate their abilities. This lack of self-confidence can deter them from pursuing leadership roles, lead them to exit STEM pathways prematurely, or dissuade them from entering the field altogether.

Motherhood and limited family-friendly work arrangements

Women who enter STEM careers often face higher attrition rates as they advance in their professions. A key reason is the prevailing workplace culture that rewards long hours and constant availability, and employees unencumbered by domestic responsibilities. This model clashes with the reality that women continue to shoulder a disproportionate share of caregiving duties. In Latin America and the Caribbean, for example, women are responsible for three-quarters of all unpaid care work – equivalent to 21% of the region's GDP (UNDP, 2024[18]) (Figure 6.1).

Figure 6.1. Gender contributions to unpaid care work as share of GDP, %



Source: OECD (2021) and satellite accounts of care for each country; compiled by UNDP (2024).
Note: The regional average is calculated as a simple average of values from countries in Latin America and the Caribbean (LAC).

STEM roles are typically demanding, offering little flexibility or work-life balance. As a result, many women struggle to reconcile professional growth with family obligations, limiting their chances of career progression. The conflict between societal expectations of mothers as intensive caregivers and workplace norms that prioritise total commitment further exacerbates this challenge. In such environments, women – particularly, mothers – often find it difficult to be recognised as equally dedicated professionals, prompting some to reduce their career ambitions or leave the sector altogether.

Male-dominated work environments and limited networks for women

Leadership positions in STEM fields remain overwhelmingly male. This underrepresentation means that many women – especially those early in their careers – lack access to mentorship, professional networks and visible role models (UNDP, 2024[6]). In such environments, women may feel isolated, excluded from informal networks, or reluctant to report incidents of bias or harassment. Without effective diversity and inclusion strategies, male-dominated workplaces can limit job satisfaction, retention and advancement for women in STEM (UNDP, 2024[6]).

Policy messages for shaping inclusive pathways: Making STEM more appealing to girls and women

According to a World Bank report reviewing global evidence on strategies to enhance female participation in STEM fields (Hammond et al., 2020[19]), several interventions show promise:

- **Addressing gender bias in educational content and curriculum.** One effective approach involves revising learning materials and pedagogical practices to challenge gender stereotypes. Biased gender norms and stereotypes embedded in curricula and textbooks influence girls' choices of what to study and what careers to pursue, risking the reproduction and reinforcement of traditional, discriminatory gender norms that negatively impact students' interests and aspirations. Men are more likely to be represented in textbooks as science professionals, by name or in illustrations, while women are more likely to be depicted in care occupations. Children are likely to internalise these stereotypes, which influence their attitudes and aspirations (UNESCO, 2024). Including stories and biographies of women who have excelled in traditionally male-dominated fields can shift girls' career aspirations from conventional paths to more non-traditional roles. Another strategy for helping motivate girls to persist in STEM is showing them its relevance to their lives by designing socially relevant curricula. Research shows that learning is more meaningful and engaging for girls when they see how STEM subjects connect to their own lives and that women may be drawn more to fields that emphasise social impact (Leammukda, Boyd and Roehrig, 2024[20]; Meiksins and Layne, 2014[21]).
- **Developing teaching methods that are more inclusive.** When teaching methods fail to cater to diverse learning needs – often adopting a one-size-fits-all approach – girls' interest tends to wane, reinforcing the perception that STEM is not meant for them. Reducing gender bias in teaching methods needs to start early. In primary school, teachers can use gender-neutral language when teaching STEM concepts and provide opportunities for girls to explore STEM activities. They can also invite female STEM professionals to speak to the class (UNESCO, 2024[22]). Engaging teachers, raising teachers' awareness of their own biases and equipping them for interactive and inclusive teaching strategies can help maintain and, even, increase girls' interest in STEM subjects as seen in (Box 6.1) (Hammond et al., 2020[19]). One strategy that has been proposed to attract more women to STEM fields is a more interdisciplinary approach to STEM education. STEAM (STEM + the Arts) is an educational approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue and critical thinking. Adding the Arts to the traditional STEM curriculum (thus creating "STEAM") allows for a more multi-faceted and engaging approach to STEM (Boy, 2013[23]) and may catch the interest of students previously uninterested in STEM (Sochacka, Guyotte and Walther, 2016[24]).

Box 6.1. Example from LAC of how addressing gender bias in educational content could reduce the gender gap in STEM

A mixed-methods study in Chile and Colombia used educational robotics to build school teachers' STEM competencies with a gender-sensitive lens. The study employed Arduino, a hands-on technology platform that facilitates the introduction of programming and electronics concepts. The programme featured workshops structured to include 30 minutes of theoretical instruction followed by 90 minutes of practical application. Among the 290 participating teachers, 52.5% were women. Feedback from the workshops revealed improvements in teachers' knowledge of robotics and heightened interest in teaching these topics to their students. Students, in turn, exhibited increased creativity, motivation and positive attitudes toward robotics (Cano, 2022[25]).

Source: (Hammond et al., 2020[19]).

- **Involving parents to reshape perceptions and attitudes.** Parents play a crucial role in shaping their children's academic performance and career aspirations. Interventions that target parental beliefs and biases can help create a more supportive environment for girls in STEM. Using brochures, websites and social media platforms to inform parents about the benefits of taking STEM classes increases parental support for girls enrolling in these courses. These efforts are particularly effective in combating deep-seated gender norms that may discourage girls from pursuing STEM-related studies (Hammond et al., 2020[19]).
- **Providing female role models and mentorship opportunities.** Girls need to see women succeeding in STEM fields to believe that they can do it too. Role models and mentors increase girls' confidence in STEM and influence their career aspirations. Female mentors can also improve the culture of STEM workplaces (UNESCO, 2024[22]). Exposing girls to female role models and mentors who have succeeded in STEM therefore serves a dual purpose: it demonstrates what success in STEM can look like and models the behaviours and pathways that lead to success (see Box 6.2). Seeing relatable examples of women thriving in STEM can help girls envision themselves in similar roles and reduce the belief gap that often holds them back (Hammond et al., 2020[19]).

Box 6.2. Example from LAC of how female role models and mentorship opportunities could reduce the gender gap in STEM

In Peru, a randomised controlled trial tested the impact of mentorship on female students' interest in STEM. Senior female students and recent graduates from a leading university in Peru visited 109 secondary schools in 18 cities (Agurto et al., 2021[26]), These mentors specialised in fields such as civil, industrial and systems, mechanical, and electrical engineering. During their visits, mentors delivered short talks addressing key topics to challenge students' preconceived notions, including the myth of fundamental differences between male and female brains; the potential for girls to succeed in engineering; the contributions of women engineers to society; and how STEM can be used as a tool to solve real-world problems. They also shared their own personal journeys in STEM. The study included 5 378 students and found that among girls in the top 25th percentile in math performance, the mentorship significantly increased interest in pursuing STEM fields – by 14 percentage points – and improved self-confidence and perceived ability to succeed in these areas by 12.5 percentage points.

Source: (Hammond et al., 2020[19]).

- **Encouraging participation in extracurricular STEM activities.** Engaging students in STEM outside the classroom is another effective strategy. Science museum visits, academic competitions, coding clubs and robotics camps can ignite and sustain interest in STEM subjects for both boys and girls. These informal learning environments often offer more flexibility and creativity than traditional classroom settings, allowing students to explore STEM topics in fun and engaging ways (Hammond et al., 2020[19]; UNESCO, 2024[22]). An evaluation of a programme that organised camps on artificial intelligence, robotics, programming skills and leadership skills training in Malawi, Namibia and Rwanda showed that it increased self-confidence and empathy among girls and that 78% of participants went on to pursue STEM subjects in tertiary education (UNESCO, 2024[22]).
- **Improving access to information about STEM careers.** Ensuring that girls and their families have access to accurate and comprehensive information about STEM career paths can influence educational and occupational choices. Understanding the range of opportunities as well as the long-term benefits of pursuing STEM can boost motivation and challenge prevailing gender norms (Hammond et al., 2020[19]). Additionally, sharing information that highlights progress toward gender equality in STEM fields can encourage girls and parents to consider these paths more seriously. In Japan, an online survey experiment tested the effects of such information-sharing. The intervention provided students and their parents with data about the availability of STEM jobs, the underrepresentation of women in STEM education, and the social stereotypes that often undermine girls' confidence such as the belief that girls are inherently weaker in math or that women in STEM are "too intellectual" (Ikkatai et al., 2021[27]). The results show that this information increased junior high-school students' motivation to pursue STEM education and strengthened parents' willingness to support their children in choosing STEM careers.
- **Adopting deliberate strategies to attract, retain and promote women in STEM fields.** Companies can proactively reach out to schools and universities and speak to students about opportunities in STEM sectors. Other strategies include rolling out personal development courses, technical skills training and hosting internship programmes (Hammond et al., 2020[19]).
- **Adopting workplace practices and policies that meet women's needs to attract and retain women in STEM professions.** These options are not limited only to STEM jobs, and include

parental leave, childcare services, anti-sexual harassment policies and flexible hours (Hammond et al., 2020[19]).

In addition to the interventions mentioned above, there are other initiatives and actions that could also prove beneficial:

- **Funding opportunities like scholarships and research grants for women in STEM fields.** STEM scholarships for girls reduce financial barriers, spark early interest, challenge gender stereotypes, and offer mentorship and community support. They help boost academic achievement, increase diversity, and empower girls to pursue and succeed in STEM. Research grants for women in tech are equally vital – they provide financial support, raise visibility, expand networks, and help overcome bias and systemic barriers. These efforts encourage risk-taking, attract more women to the field, and create role models for future generations. For instance, Peru's Strengthening National Science, Technology, and Innovation System supports women researchers by ensuring gender bias is avoided in selection processes, awarding extra points to women and underrepresented applicants, and prioritising women-led proposals (World Bank, 2022[28]). The project also includes gender-disaggregated data tracking, gender sensitivity training, and prioritises gender-informed proposals in competitive funding.
- **Building alliances between the government, the private sector and other non-state actors.** It is essential to invest in and construct lifelong STEM training opportunities through appropriate multi-stakeholder alliances involving public and private sectors, as well as academia and NGOs (G20, 2023) (see Box 6.3). Given the disproportionate job losses and disruptions faced by women, governments and the private sector must urgently support and scale inclusive STEM networks (Boccuzzi and Uniacke, 2021[29]).

What governments can do to boost girls and women in STEM

National governments in Latin America and the Caribbean can develop comprehensive legal and policy frameworks that tackle systemic barriers and promote gender equity. Enacting anti-discrimination laws that explicitly cover STEM fields, ensuring equal pay for equal work and designing gender-neutral policies such as flexible work arrangements and parental leave can contribute to more inclusive education and professional environments. Governments can also establish targets or quotas to increase the representation of women in STEM careers, particularly in academia, research institutions and decision-making bodies.

Equally important is the need for governments to invest in education and training programmes that encourage girls to pursue STEM from an early age. This includes strengthening STEM curricula in schools, funding extracurricular programmes that engage girls in science and technology, and supporting the professional development of teachers to recognise and address gender bias in the classroom. Financial incentives such as scholarships, fellowships, and research grants targeted at women – especially those from marginalised backgrounds – can further support women's entry and advancement in these fields as seen from Portugal's example in (Box 6.3).

Governments should also prioritise the systematic collection and analysis of gender-disaggregated data in STEM. Monitoring enrolment, retention and career progression across education levels and job categories can reveal where inequalities persist and guide more effective policy responses. Incorporating an intersectional lens that includes age, geography, ethnicity and socio-economic status targets efforts to the diverse experiences of women and girls.

In addition, national authorities can promote shared responsibility for care work by expanding access to public services such as childcare, elder care and parental leave. These services not only alleviate the disproportionate caregiving burden shouldered by women but enable their sustained participation in STEM careers. Governments can go further by recognising gender-equitable workplaces by awarding certifications based on their commitment to diversity and inclusion, and incentivising public- and private-sector actors to adopt and scale-up best practices.

Lastly, fostering women's leadership in STEM requires their active involvement in shaping research and innovation agendas. Governments should support and finance women's participation in national research and development programmes by addressing barriers such as age limits for applicants. They should also increase women's representation on evaluation panels and create dedicated funding streams. These steps will help ensure that women are influential in driving scientific and technological progress in the region.

Box 6.3. Examples of successful government-led initiatives in other countries

Portugal

Portugal has launched the National Girls in STEM Program, as part of its National Digital Strategy aligned with its National Strategy for Equality and Non-Discrimination. One of its strategic goals is to increase the participation of girls in STEM through early, structured and sustained intervention in secondary education, higher education and the labour market. The programme promotes the deconstruction of gender stereotypes from early childhood and complements other national initiatives such as *Engenheiras Por Um Dia* ("Engineers for a Day"). By promoting engineering and technology careers to female students in non-higher education, this programme aims to dismantle the notion that these are male-dominated fields. A government initiative, the programme is co-ordinated by the Commission for Citizenship and Gender Equality (CIG) and INCoDe.2030, digital skills training for young people, in collaboration with the Portuguese Association for Diversity and Inclusion (APPDI), the Instituto Superior Técnico, and the Order of Engineers. It involves a network of 101 partner organisations (15 of which are municipalities), 62 primary and secondary schools, and 23 higher education institutions. Since its launch in 2017, the programme has reached over 21 000 students in basic and secondary education through lab-based practices, role model sessions and mentoring.

Also the "RESTART Programme" is a funding instrument promoted by the Foundation for Science and Technology (FCT) whose first call opened in 2023. It promotes gender equality and opportunities by competitively funding individual research and development (R&D) projects in all scientific fields carried out by researchers who have recently taken parental leave. In line with public policies in this area, RESTART also covers, with specific eligibility conditions, cases of shared parental leave, which favours equality in the provision of care and the sharing of family responsibilities and leave durations.

Source: https://engenheirasporumdia.pt/

Spain

Launched in 2021, the STEAM Alliance for Female Talent: Girls on the Rise in Science is an initiative led by the Spanish Ministry of Education and Vocational Training. It fosters girls' and young women's interest in scientific and technical fields while working to reduce the gender gap in these disciplines.

The alliance promotes the STEAM educational model, which integrates science, technology, engineering, and mathematics with the arts and humanities. This interdisciplinary approach is designed to nurture creativity, critical thinking and problem-solving skills. It encourages students to actively engage with and develop enthusiasm for STEM subjects.

To achieve its objectives, the alliance seeks to eliminate gender stereotypes tied to specific careers and professions by supporting girls' participation in STEAM from early education onward. It also focuses on building collaborative strategies that involve public authorities, academia, the private sector and civil society.

Since its inception, more than 150 companies and organisations have joined the alliance, contributing to a broad-based movement to reshape the education and training system to be more inclusive and equitable for future generations of female talent in STEAM.

Source: Spain's Ministry of Education, Vocational Training and Sports, https://alianzasteam.educacionfpydeportes.gob.es/

Conclusion

While important progress has been made, much remains to be done to close the gender gap in STEM in Latin America and the Caribbean, particularly in technology and engineering. Achieving meaningful change will require co-ordinated action across policy, educational and institutional levels. From international and regional organisations to governments, educational institutions, the private sector, media and society at large, all actors have a shared responsibility to create environments that foster equal opportunities for girls and women in science, technology, engineering and mathematics.

Now, more than ever, the region must continue to advance toward a more just and inclusive future – one where women and men can contribute equally to the development and well-being of society. Gender equality is not only a matter of rights: it is a fundamental condition for achieving sustainable development in Latin America and the Caribbean.

To truly bridge the gender divide in STEM, it is essential to address entrenched cultural and societal norms that perpetuate gender biases. Educational curricula must be reformed to be more inclusive and engaging for both girls and boys, showcasing the contributions of women in STEM fields throughout history and encouraging girls from a young age to pursue their interests in these areas.

Public and private partnerships can play a significant role in supporting initiatives that promote the participation of women in STEM. Scholarships, mentorship programmes and internships specifically aimed at young women can provide the necessary support and encouragement for them to explore and thrive in these fields. Furthermore, media representation of women in STEM should be amplified to challenge stereotypes and present diverse role models. Highlighting the achievements of female scientists, engineers and technologists can inspire the next generation to follow in their footsteps.

It is also vital to create workplaces that support gender equality through policies that promote work-life balance and shared family responsibilities. This includes implementing parental leave policies that encourage both parents to take leave and ensuring that women have equal opportunities for career advancement.

In conclusion, closing the gender gap in STEM in Latin America and the Caribbean requires a holistic approach that involves all sectors of society. By working together and committing to these changes, we can create a more equitable and prosperous future where everyone, regardless of gender, has the opportunity to succeed and contribute to the scientific and technological advancements that drive our world forward. Gender equality in STEM is not just an aspiration; it is a necessity for the sustainable development and innovation of our societies.

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Gender Differences in Education, Skills and STEM Careers in Latin America and the Caribbean

Insights from PISA and PIAAC

Achieving gender equality in education is not only a matter of social justice: it is a catalyst for economic growth and societal well-being. This OECD report explores gender disparities in education in the Latin American and Caribbean (LAC) region, drawing on data from the Programme for International Student Assessment (PISA) and the Programme for the International Assessment of Adult Competencies (PIAAC) to reveal their economic and social implications. It provides an in-depth analysis of gender gaps in secondary school attainment, academic performance, career choices and skills acquisition, highlighting regional patterns and differences among LAC countries and comparing them to OECD countries. The report underscores the importance of addressing systemic barriers faced by women and girls. It offers policy recommendations to promote gender equity in education, skills, and the workforce, particularly in STEM (science, technology, engineering, and mathematics) fields, to unlock significant economic and social benefits and drive progress toward a more equitable and prosperous future for all.

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