

Latest data on science and education in Italy, with a focus on women in stem

February 22, 2024

Third and final round of evidence collected in the 2023 Science, Society and Technology yearbook: in this article we went out in search of some statistics on science education and research in Italy, with a focus on trends for enrollment in various secondary schools, the percentage of graduates by subject area, and girls/women active in science, technology, engineering and mathematics

High school

As for **secondary schools**, there are no particularly significant changes in specialization choices of neither high school or technical high school among 13- and 14-year-olds if we compare percentage data for 2012/2013 with data for 2022/2023.

As for the choice of high school specialization, we do not notice any significant changes (with the exception of an increased number in students' preference for high schools specializing in the humanities). Instead, what stands out is that in general, high school has become an increasingly popular choice (56.6 percent in 2022 versus 47.4 percent in 2012), while the percentage of those opting for technical high schools remains stable. The number of those attending vocational schools has dropped markedly (from 21.6 percent 11 years ago to 12.7 percent last year, almost half of enrolled students proportionally). This statistic data is probably linked to the one that sees a notable increase in the number of graduates: in fact, it is well known that students with high school diplomas tend to go on to university studies much more frequently (67% of those enrolled in university, MIUR 2020/2021 data) than those who complete their education in a vocational school (8% of those enrolled) or a technical school (25% of those enrolled).

Compared to 2012, when in the 15-64 age group Italian college graduates were only 13.9%, by 2021 this had grown to 17.8%, confirming a trend that has been growing for several years. Despite this, Italy remains second to last in the EU in terms of number of graduates, about 12 percentage points below the EU average (29.5%); for the 25-34 age group, we are talking about an average of just over 3 in 10 (28%), compared with a median, among OECD countries, of over 50%.

Among the various reasons for this shortage of graduates in Italy, there is certainly the fact that, in Italy, having college education does not translate into a significant economic advantage: on

[average, in OECD countries](#), a graduate earns 100% compared to a non-graduate; in Italy, this advantage is 76%.

Coupled with the rather low salaries compared to those offered by other major countries, this contributes to not making a university degree a particularly attractive option for young people in our country (or at least, not to the same extent as in countries such as the [Netherlands, Ireland and France](#), where owning a degree in this specific age group is the norm rather than the exception).

As for the subject area of graduates and postgraduates, our country is fairly in line with the EU in terms of the number of graduates in STEM subjects. 7.4% of Italian graduates have degrees in the fields of “Natural sciences, mathematics and computer science,” compared with an EU average of 6.2%; slightly lower is the average number of students graduating in “Engineering, industry and construction,” which stands at 13.8%, compared with 14.8 percent in Europe. The same applies to degrees in “Health and Welfare (12.3% Italian versus 13.5% EU). Widely above the EU average are degrees in the humanities and arts (15.8% versus 9.3%), education (12.6% versus 9.7%) and those in social sciences, journalism and information (13.9% versus 9.2%), at the expense of graduates in economics, administration and law (17.2% in Italy versus 25.2% EU).

Relatively in line are the statistics for the other sectors (Information and Communication Technology, Agriculture and Veterinary, and Services).

Women in STEM

As for “Women in STEM”, disciplinary areas were aggregated and categorized slightly differently in the two reference years: creating a comparison chart is therefore a bit awkward. However, the similarities are such that a comparison can be made.

The number of female graduates out of the total remains close to 6 in 10 in both cases, with a slight decrease (58.3% in 2020) compared to 2012 (60%). The number in the most representative area, teaching and education, remains largely unchanged, while the proportion of women declines slightly in the fields of linguistics (from 87% to 83.8%), psychology (from 85% to 81.8%), economics (from 53% to 48.9%) and political-social sciences (from 65% to 62.6%).

On the other hand, the decline in the fields of literature-humanities (from 70% to 61.5%), law (from 62% to 55.3%) and Physical education (from 41% to 33.4%) is significant.

With regard to stem disciplines, the comparison is slightly difficult, since in the 2012 one there is no specific category for the ICT field data, which is probably aggregated, depending on the specific majors, under the two categories “scientific” and “engineering”. In contrast, for 2020 there are even two separate data categories for “computer science and ICT technology” and “information engineering,” which is aggregated with “industrial engineering.” However, even this different arrangement may be a sign of changing times: technical and scientific faculties are becoming increasingly specialized, which is reflected in the need to distinguish them into more macro-categories. Definitely a sign of changing times is the rise, in general, of the female presence in STEM fields. Most likely, the kindling of public debate on the issue of women’s underrepresentation in [STEM fields and the policies](#) of public and private institutions to incentivize women’s participation have shaped a new academic climate, within which the cliché “Women are not made for science subjects” carries less cultural weight than in the past. The growth in the “science” subject area is almost exponential: from 35% in 2012 to 58.1% in 2020. It is hard to compare the generic “engineering” and “architecture” of 2012 (24% and 53%, respectively) with the different forks of “industrial and information engineering” (25.9%), “civil engineering and architecture” (44.3%) and “computer science and ICT technology” (14.3%).

Although a small improvement can be seen, it is certainly not comparable to that of the “scientific”

category. Since it is in scientific universities that the basics of technical subjects with a more “applied” bent, such as engineering and computer science (the most underrepresented field, where only 14.9% of degrees are earned by a woman), it can be said with reasonable certainty that the reasons for these gaps are cultural: the figure of the “basic woman-scientist” is more socially accepted and promoted than the “woman-engineer” despite the fact that STEM skills should be – though in different fields – possessed more or less equally.

The road to equity is certainly still a long one; however, there is no denying that some small big steps have been taken.

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<https://magazine.fbk.eu/en/news/latest-data-on-science-and-education-in-italy-with-a-focus-on-women-in-stem/>

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