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Women, Development, and the Knowledge Society in Latin America

Expert paper prepared by:

Judith Zubieta G.*
Institute for Social Research
Universidad Nacional Autónoma de México (UNAM)
Mexico City, Mexico

Introduction

Much has been written about concepts related to globalization and the information society. However, fewer works have actually reflected on what the knowledge society means to development, particularly from a gender perspective.

Some authors point out that the knowledge society not only involves the application, generation and accumulation of knowledge and technology use; but also implicitly includes the concept of a society that is efficient and competitive. From the perspective of a systemic approach, if society as a whole has to be competitive, it is necessary that each and every one of its parts is also competitive. This, however, does not happen in many regions of the world and Latin America, unfortunately, is no exception. As the region with greatest inequality in the world, surpassing even the African continent, Latin America has the widest gap between

* The views expressed in this paper are those of the author and do not necessarily represent those of the United Nations.

wealth and poverty. It is also the region where other dimensions of inequality, in particular gender inequality, interact with this gap.

A society cannot achieve competitive conditions if women, who constitute half of its members, do not benefit from development. Latin American countries have consistently reported, with the exception of Cuba and Brazil in some indicators, that women do not have equity in access to education, paid work, generation of knowledge and the benefits derived from it, as well as to the so-called "new technologies".

In the words of Amartya Sen (1985), the information society allows new ways of being, but also allows new ways of doing. Developing countries can hardly benefit from the virtues of the knowledge society if they do not leverage the talent of their people; that is, the talents of both men and women. The best way to do so, not only for basic justice but even for economic reasons, will be to guarantee universal access to education.

Education is the indispensable condition for development; if Latin America is to participate in the concert of Nations, then women ought to be formally trained and guaranteed access to jobs, especially those related to science and technology (S&T), and not only at the operational level, but also in decision-making.

As it will be pointed out later in this paper, information and communication technologies (ICTs) play an important role in education initiatives, as narrowing the technological gap increases both women's and men's access to new opportunities and enables them to perform better in a highly competitive world.

Women in the knowledge society

On the verge of finishing the first decade of the 21st century it is worth recalling that, in general, during the first half of the last century, the world economy was divided in three major sectors: agriculture; industry, and services. In those years, countries exporting their agricultural products experienced times of great prosperity while classical economic models seemed have adapted quite well to reality. Several countries in this region enjoyed rich farming and animal husbandry activities, became self sufficient in terms of food and even exported great shares of their overall agricultural production, and thus strengthened their economies. Many factors began to change, however, when new technologies emerged and evolved.

With the introduction of technology in most production processes during the 1960s, the structure of the global economy began to change quantitatively and qualitatively. Despite soil exhaustion, global climate change and problems arising from a shortage of water or from flooding, agricultural production increased since crop yield also improved. Global economic output, however, fell. This shift can be explained in terms of a change in the relative value of products from different economic activities.

Indeed, in the second half of the 20th century, industry began to occupy a more prominent place in the world economy, and all services – which previously represented only a third part – became more and more important, covering around 60% of it, approximately. It is

clear that this shift in the relative weight of services is directly linked to the introduction of new technology. This change not only exacerbated the gap between rich and poor nations but also emphasized the differences between the classical economy and the knowledge-based economy.

Unfortunately, Governments of most countries in the region have shown an enduring lack of commitment and interest in allocating financial resources to science, technology, and innovation, which in turn has generated great technological dependence. This dependence becomes an additional gap not only among countries but also within countries.

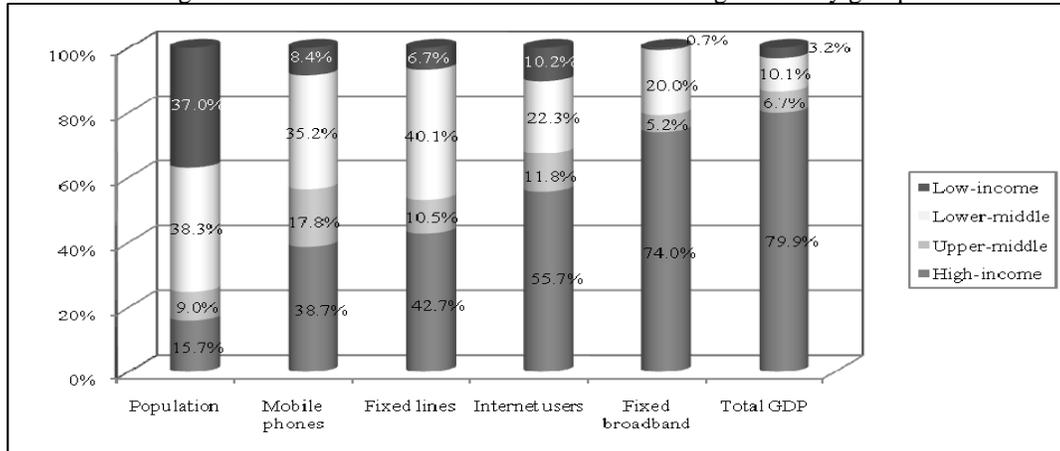
All available empirical evidence, including from sources such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Organization for Economic Co-operation and Development (OECD), the World Bank, the United States Agency for International Development (USAID), etc., show that comparisons reveal many differences, and that these may prevail or may even be accentuated when carrying out gender analysis in a comparative perspective. Needless to say, they negatively impact the possibilities for economic and social development.

Numerous studies refer to several technological gaps between countries. The first one is the gap between those generating knowledge and technology, and those that use it without participating in the knowledge and technology generation process. While there are those who say that knowledge is universal, there are others who deny it, based on the fact that knowledge embedded in a patent, or knowledge attached to a form of domination, are not free. In order to achieve a balanced assessment of the benefits of a knowledge society, we must bear in mind that it is not always accessible and that even when it is accessible; it is rarely in the form in which developing countries may require it.

Most developing countries are permanently exposed to knowledge and technology improvements that are generated in the first world but these are not free. Despite the fact that technology acquired abroad is not always open source nor free and that it often becomes obsolete quickly, it is important to be aware of the associated resources that are related to certain markets or to imports (whether they are consumer goods, intermediate goods, or capital goods) and to commercial trade. Although the Internet allows us to access some kinds of knowledge, we must not forget that not everything is available on the network, which not everyone has access to the network and, in addition, that access represents a cost to the users.

Given this panoramic view of the current situation, and given that the region was seriously impacted by the global economic crisis that began in 2008, Latin America has to start investing in technology and in training human resources to develop its own appropriate technology. Developing countries have gradually incorporated technology, but have done little to develop their own technologies and to train people to satisfy demands arising from these activities. Lack of knowledge, lack of skills and lack of competences will continue to inhibit greater benefits from technology transfer and from knowledge generated in industrialized countries. Globalization has increased the use of ICTs in the world, widening the gap between rich and poor nations.

Figure 1. Distribution of different variables according to country groups



Source: United Nations, World Information Society 2007 Report, consulted in September 2010 at: <http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/WISR07-summary.pdf>.

Figure 1 shows the distribution of different types of ICTs among four country groups: low income nations, including most sub-Saharan African countries, lower-middle income countries, including some Latin American nations and China, upper-middle income countries, including the Republic of Korea and Singapore, and those with high income, including most northwestern European countries, the United States of America, Japan and a few others in Asia.

The first column displays the striking fact that more than 70% of the world's population resides in low and lower-middle income countries. Data in the remaining columns reveal that there has been a steady expansion of digital opportunities, both in terms of improved access to basic ICTs and also in terms of growth in access to high speed, fixed and mobile network technologies. Doubtless, the number of people who currently have access to the benefits of ICTs is the highest in the history of mankind.

It is clear that mobile phones represent an opportunity to reduce the digital divide, as much as it is evident that those economies which properly invested in research and development (R&D) and in human capital formation, are already taking their place in the group of high-income economies. Data from Figure 1 could also be used to define whether or not developing countries want to have a stake in the world in the long run, and thus it will depend on the investment and resource allocation they make once priorities are set on budgetary matters and public investment plans. Sure enough, the expansion of digital opportunities and wider access to ICTs may contribute to improved economic performance in many parts of the world only if the abilities of their users increase.

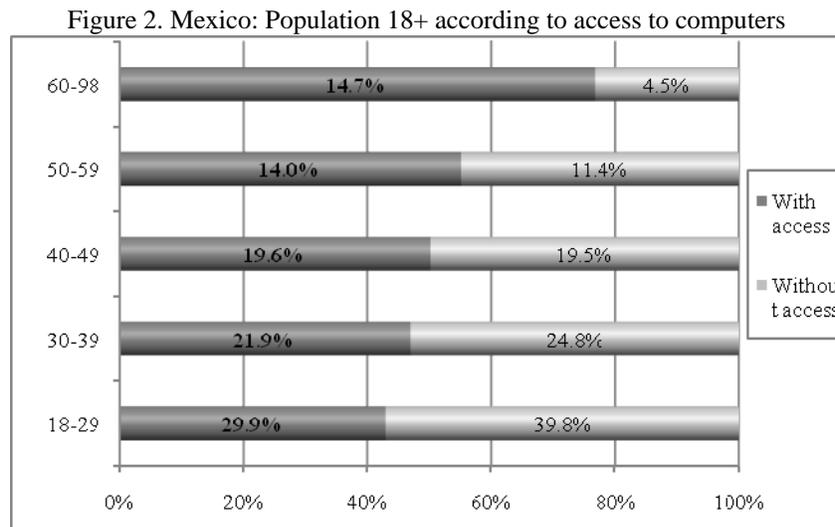
The only way for our region to move towards the knowledge society is through the design and implementation of policies that strengthen knowledge-based economies, i.e. economies conducive to transforming knowledge into wealth. Key variables for the emergence of the knowledge society are education, science, technology and innovation, not for half of the population but for both, men and women.

Latin America has many assets and characteristics that could position it in a privileged situation with a high potential to become a competitive niche. Indeed, while it has made progress in the so-called "Western knowledge" through a small but high-quality S&T community, there is increasing awareness of the importance of knowledge originating from indigenous practices and local traditions.¹ While this knowledge has often been despised or undervalued; there is abundant evidence of the comparative advantages that this type of knowledge can provide in a highly globalized world. By properly assessing it, we will be able to overcome values attached to consumer societies which are constantly sending messages through the mass media, where "how much you own" has higher value than "how much you know".

Among all the actions that should be undertaken to reduce the digital divide between developed and non-developed countries, we shall mention the following:

- Disseminate the potential benefits arising from technologies;
- Improve the quality of education, particularly at the elementary and high school level, including ICTs learning and appropriation;
- Increase the skills and competences of the population in general;
- Ensure access to technologies and availability of required infrastructure;
- Promote an electronic "culture" in society at large.

New technological gaps arise within each country or region when other variables such as age, sex, rural/urban condition are analyzed. In the forthcoming paragraphs, for example, some figures are presented to show gaps found in Mexico's adult population. Needless to say, they have become obstacles to development.²



Source: INEGI / CONACYT: Encuesta sobre la percepción pública de la Ciencia y la Tecnología en México, 2009.

¹ "Western knowledge" in this paper is used to refer to knowledge usually generated in a laboratory or in a professional setting by well-trained scientists, mathematicians, and engineers.

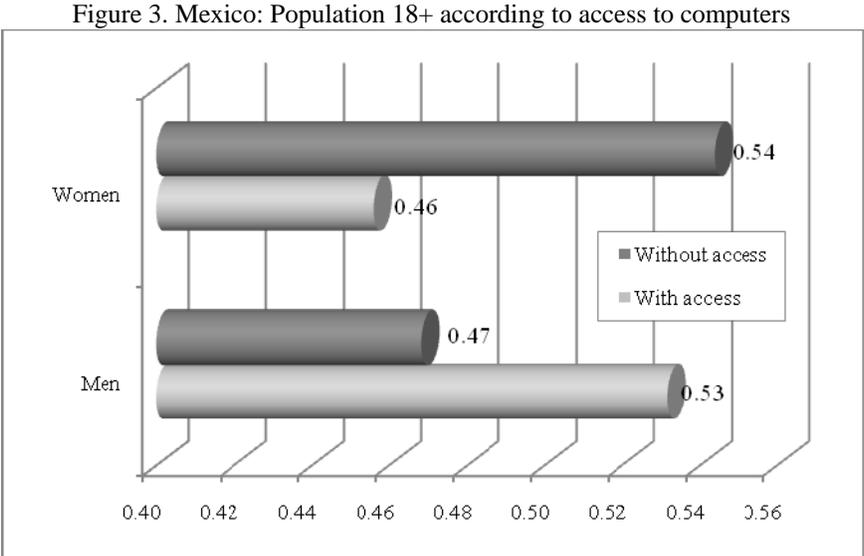
² Adulthood in Mexico starts at age 18.

Age is a variable that generates some differences in the population. Figure 2 clearly shows that the older the population, the larger is the technological gap between youngsters and adults. Most members of the younger group have access to a computer, while among the eldest, the ratio does not even reach 15%.

Related literature suggests calling these two groups "digital natives" and "digital migrants". The former are those who were born in the computer era, while the latter are those who had to make an effort to overcome the transition into the current digital age. If the potential of young adults to access computers decreases, they will be totally excluded from the highly competitive labor market in the near future.

The negative impact on the well-being of the population is undeniable. We have to consider that young adults are in the productive and reproductive ages of their lives; but also that the number of single parent households has been growing in recent years.³

Unfortunately, Mexico – like many other countries in the region – is still an example of long-standing inequalities between men and women in many arenas. When it comes to higher education, to remunerated and well-paid employment and to access to knowledge, the gap broadens. With fewer opportunities, women are more vulnerable to poverty.



Source: INEGI / CONACYT: Encuesta sobre la percepción pública de la Ciencia y la Tecnología en Mexico, 2009.

If Latin America really wants to increase its competitiveness, it is essential to overcome these gaps and train human capital to meet the global economy’s demands. Along with education, stronger efforts are needed to design and implement policies and normative frameworks portraying gender equality as their ultimate objective, as well as those related to

³ Single parent households are commonly headed by women who usually work double or triple shifts as they are mothers and constitute the sole economic support for all members of the household.

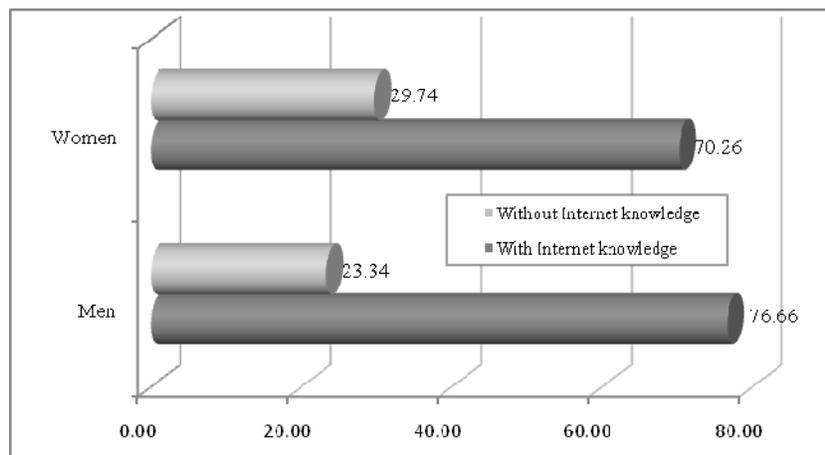
enforcing the law. Brazil, incidentally, is one of the few countries in the region that has improved its educational system, particularly with regard to enrollment in postgraduate studies and high graduation rates in doctoral programs.

In education, another action that should be encouraged is to promote women's participation in subject areas in which they have traditionally been absent. Enrollment distribution in many countries of the region reveals high levels of horizontal segregation, with women being overrepresented in humanities and liberal arts, as well as in fields related to caregiving (children, health, etc). Unfortunately, this overrepresentation goes hand in hand with a low participation of women in exact sciences and in various branches of engineering, and other technical fields.

There is no doubt that this skewed distribution of the female student population has to be modified. Without any prejudice to the importance and transcendence of social sciences and humanities, the areas which have traditionally been linked to knowledge generation and its impact in economic values are engineering and other technical disciplines. They have proven to provide better opportunities to compete in markets associated with the knowledge economy.

The last variable to be discussed in this paper deals with knowledge (and use) of Internet, as shown in Figure 4. Once more, it is easy to acknowledge differences in data reported by both women and men; however, we must remember that this gender gap intersects with other socio-demographic variables such as age, religion, and ethnicity.

Figure 4. Mexico: Population 18+ according to Internet knowledge



Source: INEGI / CONACYT: Encuesta sobre la percepción pública de la Ciencia y la Tecnología en México, 2009.

For many countries it has not been difficult to reduce the digital divide in terms of access to computers and the Internet. The gap in technology knowledge and use among women and men, however, has proved to be more difficult to reduce. This gap arises as women and men know and use different technologies for different purposes. A few recent papers on the subject say that women's use of ICTs is limited compared to men's.

Several studies carried out in other parts of the world have shown women's limited use of ICTs. Moreover, the type of information that women are looking for on the Internet is different from that explored by males. Some authors explain these differences in terms of traditional roles that women inherit or assume, due to their potential role as mothers or to cultural values. For example, activities such as caring for children and ageing parents, among others, may become handy while explaining the biases in the way in which women relate to computers and to Internet.

It is not difficult to conclude that even if men and women have equal access to ICTs, it does not guarantee equal activities, neither same usage, nor decreasing differences in the quality of their experience as users. Therefore, equal access to technologies in no way should be interpreted as gender equality.

Millennium Development Goals (MDGs)

Within the framework of the Millennium Development Goals (MDGs) – based on the Millennium Declaration, signed and agreed upon by 189 countries in 2000 – commitments have been made in several areas. Latin American countries were no exception and committed to: a) promoting gender equality; and b) fostering the empowerment of women. The latter refers to guaranteeing equal access to remunerated jobs, knowledge, and technology.

Commitments were made to increase, by 2015:

- The share of girls versus boys in elementary, secondary and tertiary schools;
- The share of women with remunerated jobs in non-agricultural sectors;
- The share of women in political representation posts.

If women do not advocate their presence and voice in spaces of political representation, we can hardly mainstream gender issues towards a greater number of women, especially those who are still very young. Advancement of women means progress for all members of society, and not only for slightly over half of the population. That is why women should be guaranteed equity in their access to knowledge, and S&T.

Various studies have shown that investing in women generates benefits, both socially and economically. Latin American demographers have consistently reported for many decades that educated mothers are good predictors of the schooling of their children. Women's education has medium and long term benefits, including poverty reduction. In this way, one can say that higher education of women will positively affect the well-being of both families and society as a whole. Indeed, today we have enough evidence that investing in women's education, especially young women, effectively break intergenerational cycles of poverty.

As previously mentioned, women do not constitute half of the student population at each grade, hold half of the decision-making level positions, represent half of the economically active population, nor occupy half of the seats in national legislatures.⁴

An additional indicator deals with employment and wages. Some Mexican urban employment surveys have shown that in equal conditions of instruction or vocational training, women earn 70% of the income earned by their male colleagues. In addition, some women who possess appropriate qualifications are not admitted into the labor market. A report prepared by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC, 2002) indicates that 57% of qualified Mexican women were unable to find a formal job. Obviously, this means that the investment made by the Government to educate them is not generating the expected benefits.

Regardless of women's marital or employment status, this situation highlights certain types of discrimination and greater waste. Some women may not have access to formal employment, either due to family responsibilities which prevent them from working, or because they might be engaged in unpaid work. Under any point of view, this is absolutely unfair.

As the report of the European Technology Assessment Network (ETAN, 2000) pointed out, women are under-represented, under-employed and under-valued in most fields. This under-use of human capital has a negative impact on a country's competitiveness and thus it is unsustainable.

Some alternatives and other options to bridge gender gaps

As pointed out earlier, any initiative or policy that is designed to reduce these gaps in our economic and political systems must include investment in women's education. This allocation should generate better conditions to achieve progress and equal opportunities for women and men in the labor market.

These changes must necessarily be accompanied by structural changes and cultural transformations in values and norms, but perhaps more emphatically, in gender stereotypes. Our societies should not continue to encourage or allow girls to be excluded from a wide range of activities related to science, while boys are enjoying them all.

The work of teachers and trainers of new generations transcends the communication and dissemination of disciplinary knowledge. The challenge, in particular for teachers and lecturers, is to assume the responsibility of role models to inspire younger generations. For female teachers, the commitment needs to be even higher since girls and young women often look up to them.

⁴ It is worth mentioning a topic referred to as the "Juanitas' case" in Mexican Judiciary history. The case is about Congresswomen who resigned their positions after being elected, even though their nomination was based on the "gender equity rule". Once their resignation was effective, their husbands or some other males replaced them. This was possible because of the legal process for the "substitute", which does not include a gender perspective.

ICTs are an invaluable resource to empower women in developing countries or regions where time availability is scarce, isolation is widespread, and access to knowledge is limited. Thus, it is possible to assert that these technologies are tools that can promote economic development and social change.

Access to ICTs and Internet connectivity are only meaningful if there is a process of technological appropriation, since only so can they be appreciated by future users. These tools become meaningful when efforts are made to open new educational spaces in sectors that have been traditionally marginalized from education, allowing them access to new opportunities for learning and growth.

Despite the – real or perceived – limitations that ICTs have for a new user, they have many advantages, aside from the flexibility of their use in time and space. It is worth mentioning that they facilitate access to multiple sources of information, to information itself and to knowledge. In addition, they provide additional incentives to reduce illiteracy and enhance education.

Any policy designed to contribute to narrowing the gender gap should focus on education, the labor market – with jobs associated to the skills and expertise women may acquire –, and access to and use of technologies required by these jobs.⁵

In this sense, we must insist that investments in S&T should be closely related to national development strategies, which in turn should frame all efforts to build local capacities to generate, acquire and use knowledge, derived from Western-like science, as well as from indigenous and traditional understanding.

Several examples may be drawn from other countries which have built and developed these research and development (R&D) capacities. Even though they were facing similar conditions some years ago, they managed to properly allocate resources and got ahead in their efforts to increase their well being. Indeed, they can be a source of inspiration if Latin America is to meet the challenges lying ahead.

Last but not least, attention should be paid to the legal framework, as previously mentioned. Without a doubt, appropriate normative and legal infrastructure is key for gender mainstreaming in as much as it is to develop social commitment to incorporate a gender perspective in all public policies and programs, not only those related to education. We may conclude that education is central for a systemic approach to development in Latin America as well as in other regions of the developing world.

⁵ Cf. OECD, ICTs and Gender – evidence from OECD and non OECD countries, 2007.

ICTs and distance learning: reasons for hope

The use of ICTs in distance education has given rise to many opportunities for men and women in developing as well as in developed countries. Experiences linked to both formal and non-formal education projects are of particular interest for women's empowerment.

Access to and use of ICTs allows for the promotion of gender-sensitive content and for mainstreaming gender equality in classrooms and schools, regardless of age and geographical location. In this sense, technology thus promotes social change and improves the living conditions of girls and women. ICTs also enhance the capabilities of women in a context characterized by scarce time, limited mobility, restricted access to knowledge, and relative social or geographical isolation. ICTs can provide marginalized women, who have limited access to education, with information and knowledge that will enable them to play a more active role in society. As those technologies become more and more relevant to their interests and needs, women will develop skills and competences that are in demand in the labour market, and which will lead to the emergence of home-based, or partially home-based, job opportunities.

While there is a growing awareness that ICTs are not gender-neutral and sometimes require a certain degree of knowledge of foreign languages, it is likely that women's use of ICTs will increase, and the more women use them, the more likely it will be for them to hold a stake in their design and development. For that matter, appropriation is a core issue and should be enforced simultaneously with efforts to increase women's access to technology.

As OECD pointed out in its 2007 report on *ICTs and Gender – evidence from OECD and non OECD countries*, policies should focus on the following areas to narrow the gender technological divide: 1) providing ICT education and training; 2) generating ICT-related jobs; and 3) guaranteeing access to access and use of ICTs.

There should be no need to insist on the importance of ICT education and training for women. Evidence from all over the world shows how well women perform in virtual environments, where they can avoid gender stereotypes, improve their self esteem on their performance in scientific courses, and enhance their learning capabilities. Even role models are more readily available through certain technology-mediated forms of communication.

Nonetheless, there are several issues to consider while advocating education. As mentioned previously, emphasis should be placed on the observance of laws, norms, and regulations promoting girls' and women's access to all forms of education and learning.

Public policies should promote female education while raising awareness on gender issues and biases. Such policies must guarantee girls', boys', women's and men's equal access to and use of ICTs. In order to mainstream gender in education, it is also important to develop indicators and to collect sex-disaggregated data which will allow gender analysis and will highlight differences between women and men.

Finally, it is worth mentioning that professors can perpetuate gender biases and discrimination in education, regardless of whether it is virtual or face-to-face education.

Training of professors should include gender sensitization, including stressing the diversity of the student population (related to social, ethnic, cultural, or sexual conditions), preventing issues associated with gender-related violence (both physical and symbolic), and developing awareness on the form and content of educational materials.

In conclusion, ICTs can promote lifelong learning for both students and professors, regardless of sex and age. Therefore, any strategy designed to promote the use of ICTs for development should explore its advantages and potential in education to narrow the gender divide.