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Organización
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para la Educación,
la Ciencia y la Cultura

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منظمة الأمم المتحدة
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Office of the Director-General

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**Theme 1: Girls' education- a prerequisite to access to science and
technology**

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Multiplication not Division: Overcoming the Gender Divide

I am delighted to have been invited to speak here today on issues which cut across all of UNESCO's domains of action. In particular, as gender equality is one of our two global priorities and educating girls is at the top of our agenda. The mutually reinforcing powers of combining gender equality and education remind me of a now famous quote by Queen Rania. Speaking of the MDGs, she noted that they are the only case where $2+3=8$, given the cross-cutting benefits MDGs 2 and 3 - education for all and gender equality –on all the other goals.

The gender divide does not follow mathematical rules either. With gender, when we add one to one, we still get 1 – or at least not quite two. We get half of what we could get because we divide humanity in two. This said, from another perspective, the solution lies precisely in making sure that one plus one does equal one – one humanity united rather than divided by multiple factors of discrimination.

This vision of humanity as united, rather than divided, lies at the heart of UNESCO's mission to foster a culture of peace. It also lies at the heart of a universal ethics for this globalized world that our Director General has been calling new humanism. This vision is about sustainability and turning words into actions. As Gertrude Monghella so rightly said at last year's celebration of International Women's Day at UNESCO Headquarters, 'the gender issue should become a new culture of humanity.' It is in this way that gender equality can be sustained and passed on down future generations.

Science and technology form an integral part of this humanist vision. As Professor Anne Dejean-Asséma, winner of the UNESCO-L'Oréal prize for Women in Science (Europe), 2010 reminded us:

'The issue that matters most at this moment is continuing the quest for knowledge, for the good of our planet and its inhabitants ...

Fundamental research represents a country's future, and its scientists are a resource that must not be wasted.¹

Science *is* public health, maternal health, reducing child mortality and the fight against HIV/ AIDS. Science *is* climate change mitigation and protecting biodiversity.

The need to nurture and sustain life and health has never been so great. The need to sustain and nurture the connections between us - making use of new technologies – has never been so great.

Currently, however, we are wasting resources of all kinds. And in doing so we are denying women and girls the literacy – including science and technological literacy - they deserve to be able to fully participate in all these debates. Two issues are at stake.

The first involves the persistent gender inequalities that deny many girls access to even a basic education.

The second issue involves the disparities specific to science and technology, which (apart from the life sciences) remain statistically masculine disciplines, failing to attract or retain capable or competent female students. At a global level, women hold over half of university degrees, but only 30% are in sciences or technology.² The talented women who do persist are less likely to translate their qualifications into S&T employment. Those who do are less likely to reach the highest, managerial levels than men, are often paid less and are less likely to be promoted.³ Indeed, only 29% of the world's researchers are women. There are striking regional disparities – women constitute 43% of researchers in Latin America and the Caribbean compared with 15% in Asia. These regional variations hint at the socio-cultural underpinnings of the inequalities in these sectors.⁴

Elizabeth Blackburn, another concerned winner of the UNESCO-L'Oréal Woman in Science prize, told us:

'I see the difficulty for girls who are thinking about a career in science: they love the science and they feel daunted at the same time. How can we give them the **confidence** and the **tools** to deal with things that may deflect them from the careers they want?'

How can we respond to her question and to the two issues mentioned above? How can we multiply their chances rather than divide? Let us briefly explore some of the keys to giving girls the tools and the confidence that they deserve.

¹ Pr. Anne Dejean-Asséma, UNESCO-L'Oréal Laureate for Europe, 2010.

² Science Needs Women.

³ EGM: 9

⁴ From my background paper for the EGM.

First, the **tools**. The first pillar that needs to be reinforced requires going back to basics; basics in which girls too often lose out and fail to receive the ground stones of learning that would enable them to go further. Gender disparities in most regions have been narrowing. It is possible to get more girls into schools. Reducing school fees and the other costs linked with education – such as uniforms, books and transport – has been found to be particularly effective.⁵

Let us briefly look at an example from Yemen, where – although it is one of the world's poorest countries – school enrolment rose by almost 50%⁶ between 1999 and 2005. At the same time gender disparities shrank. Girls benefited both from the overall expansion of education and targeted interventions. The former included using low-cost school designs, consulting with communities on school location and making basic education compulsory and free. In 2006, the costs of education for families were further reduced when uniforms were made optional and textbook fees for girls were eliminated for 6 years of schooling, versus for 3 years of schooling for boys. In addition, there was an effort to get more female teachers to rural schools. Among the poorest families, where child labour is rife as the result of economic necessity, girls remain disadvantaged. Pursuing these schemes further and increasing the number of female teachers and adding cash incentives to get girls into school could help reach more children and address resilient gender inequalities.⁷

To move from gender parity to gender equality, it is essential to move from access to education to a quality education for all. Too many children leave school lacking basic literacy and numeracy skills. In sub-Saharan Africa a child who has 5 years of schooling has a 40% chance of being illiterate. What chance do these children have of becoming the next generation of science researchers?

I will address the question of getting girls into science education in a moment. For now, I want to highlight the related need to ensure the *quality* of science and technology education in particular. Poor quality, irrelevant science and technology education poses a dual threat. It weakens the knowledge base of these vital subjects. Courses may fail to provide the skills or professions needed in the job-market. In both cases, students are deterred from pursuing these subjects, creating a vicious circle of failure and disinterest.⁸ Research has found that girls are especially interesting in understanding how S&T fit into the bigger picture – whether the social, environmental or work context. Girls have also been found to be motivated by hands-on activities and application to everyday life and the environment. It has been suggested these interest should be considered in curriculum design to attract more female learners. The benefits of making curricula relevant to the job market and to the challenges of society are not to be underestimated in their ability to engage students, especially female students.

⁵ UNESCO, 2007: 75

⁶ 'Enrolment increased from 2.3 million in 1999 to 3.2 million in 2005 and gender disparities shrank.' (GMR, 2010)

⁷ UNESCO, 2010: 66-67.

⁸ EGM report: 7

Providing a relevant and stimulating curriculum that awakens girls' interest is perhaps the first step in raising the number of girls who choose to study science and technology.

This brings me to the second point: how do we boost girls' **confidence** in science and technology? We know that career choices are 'shaped by individual choices, everyday realities and material conditions. International, national, institutional, family and personal levels all influence the choice that a girl makes.⁹ It is striking that a couple of these award winning scientists cite the important role played by family support – in particular from their mothers in encouraging them in their careers (in one case a scientist and women's right campaigner, and in the other a housewife who had ambitions for her daughter). A UNESCO report found that these sociocultural attitudes play a key role in determining which choices are seen as appropriate for girls, passed down from parents to children. For instance,

'A study in Mali found that almost one-third of households surveyed differentiated enrolment choices for girls and boys because boys were considered to be more intelligent. Similar attitudes prevail in developed countries: a study in the United States found that parents consider their sons to have greater math abilities than their daughters, despite the lack of evidence of gender differences in grades or test scores.'¹⁰

Consequently, the second pillar – and this is a huge one! – involves combating the negative stereotypes of women that deter them from pursuing science and technology. The secret lies in providing ample positive examples and role models. I have already mentioned the UNESCO-L'Oréal prize for Women in Science, which in recognizing the achievements of these talented women does precisely this.

Education can help provide positive role models in different ways. School is an important site in which we can do this. It goes hand in hand with boosting access to science and technology subjects.

I have already mentioned the need to deploy more female teachers to inspire girls; this could not be more true than in science and technology, where women teachers are particularly lacking. UNESCO has stressed the crucial role female teachers play as role models. They play key roles in educating and socializing children beyond gender stereotypes, and so are crucial agents of change.¹¹

Additionally, teachers play a second important role in the attitudes they communicate in the classroom.

⁹ EGM report: 6

¹⁰ UNESCO, 2007 : 66-67.

¹¹ UNESCO, 2006.

Studies show that teachers tend to answer boys more often than girls in math and science classes (in both the developed and the developing world) and pay more attention to girls in non- science classes, practices that send clear messages about how perceptions of capacities are culturally embedded.¹²

Therefore, the attitudes that teachers communicate in the classroom are also essential; they can be a seed bed for the propagation of gender stereotypes. For instance, a study tested the attitudes of science teachers in China by reading them an identical description of a science student. When told the student was male, 71 % rated him as good. When told the student was female, only 20% rated her as good.¹³

In this light, UNESCO has highlighted for need to gender-sensitive teacher-training. To provide but one example, a training module on 'Girls and Science' was created to sensitize teachers and education staff in Africa about these issues. The module encourages them to promote a positive image of women in scientific and technical careers and provide necessary career guidance for girls who are interested in these careers.¹⁴

UNESCO has also emphasized the need to ensure that learning materials are gender-sensitive and do not contribute to perpetuating these negative stereotypes. Research has found that not only are females under-represented, but that both males and females are depicted in gender-stereotyped ways, constraining girls and boys visions of who they are and what they can become.¹⁵

Finally, more broadly – the media –both national and international – plays a powerful role in shaping stereotypes. Much could be gained, therefore, by sensitizing science journalists to the issues of gender equality and development which are at stake in their communications. These journalists and other science communicators could be enlisted to help us multiply rather than divide by presenting positive images of women as scientifically and technologically competent and capable; as having both the tools and the confidence to succeed.¹⁶

All of these elements form part of the bigger picture of our work on gender equality. They form part of creating a shift in societal attitudes towards women in science and technology.

It is only by shifting the context in which these choices are made that avenues of participation can be opened up for a greater number of women and girls in arenas that have traditionally been dominated by men.

These issues, then, are not unique to science and technology; they also affect the world of business to varying degrees. Earlier this week, a UK newspaper reported that 'women still face a glass ceiling' after a survey

¹² UNESCO, 2007: 71

¹³ Lesser Blumberg.

¹⁴ From EGM background report: 8

¹⁵ Lesser Blumberg.

¹⁶ EGM report: 11.

found that, '73% of female managers believe barriers to advancement still exist.' The current debates, therefore, bring us back to my starting point: the imperative of escaping the fallacy of a gender divide that separates men and women and denies the world the accomplishments of half of humanity. I believe education - quality education for all without discrimination - is the vital ground stone on which to build if we are to achieve this. Then, we may aspire to a humanist vision -a vision which by definition places the human at the centre - and one which may inspire us to consider a new way of evaluating our achievements. Allow me to leave you with some wise words from a Native American leader, who beautifully summarized the essence of this vision:

'I do not think the measure of a civilization is how tall its buildings of concrete are, but rather how well its people have learned to relate to their environment and fellow human beings.'¹⁷

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¹⁷ Sun Bear of the Chippewa Tribe