

The Natural Sciences Sector
UNESCO

Harnessing ICTs for Greater Access to Education for Girls and Women: STEM Education at UNESCO

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Format

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- MDGs and SDGs
- Girls in Science and Engineering
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 - Women in Computer Science
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- Getting more Girls and Women into ICTs and STEM

Food for thought?

- More people have mobile phones than toilets! Six of the world's seven billion people have mobile phones - but only 4.5 billion have a toilet - UN Study
- Now more mobile phones in the whole of Africa than there are in the USA
- 2001:25 million- 2012: 650 million (increase 2600%) - The Higher Times, Sept 2013
- Close to four billion people now use the Internet.
- Internet penetration at 15.6% in Africa, +- 83.6% UK, but in Somalia it is 1.2% - Internet World Statistics



Food for thought?

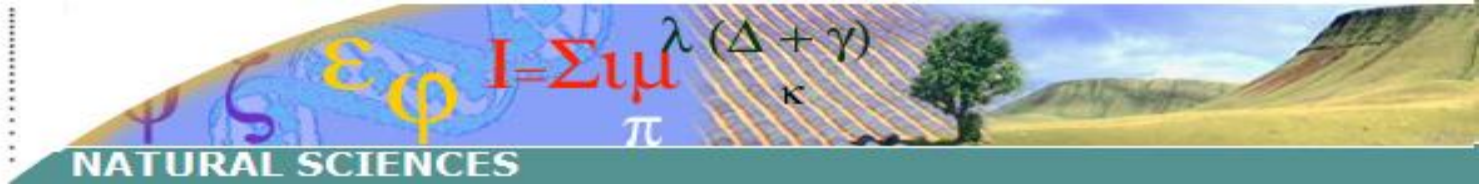
- 1.76 billion people owned a smartphone in 2014 (up 25% than 2013); “...by 2017, more than a third of all people around the globe will be smartphone users..” - eMarketer, 2014
- 25% fewer women are online than men in developing countries - with this figure rising close to 45% in sub-Saharan Africa.
- More women play video games than ever before (52% gaming audience) -Internet Advertising Bureau, 2014
- Bringing another 600 million women online could contribute +- \$13 to \$18 billion to the annual GDP across 144 developing countries



Social Media and the Internet

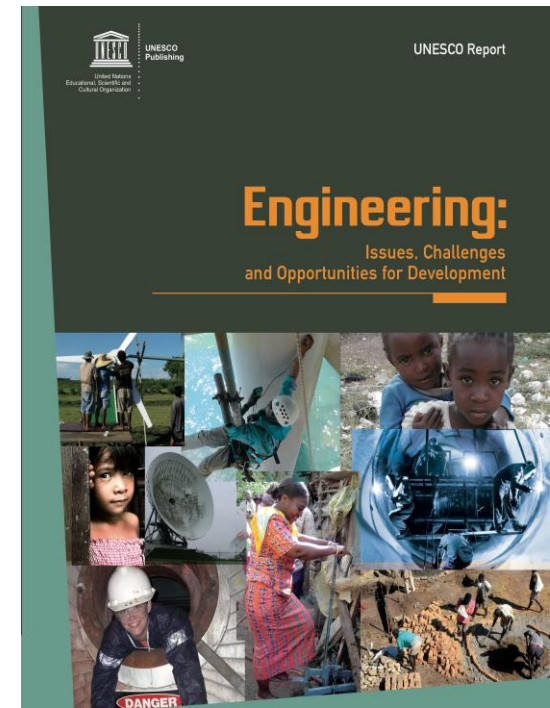
- As of the first quarter of 2015:
 - Facebook had 1.44 billion monthly active users. This translates to 50 per cent of Internet users worldwide.
 - YouTube reported over 72 hours of video uploaded every minute.
 - Twitter averaged 236 million monthly active users.
 - Some 500 million people use the WhatsApp mobile text messaging application. In India alone WhatsApp users reached 70 million per month -
Cyber Violence against Women and Girls, 2015





UNESCO and Girls in STEM Education

- UNESCO - diverse in terms of Culture, Education, Communication and Information as well as Science
- *Global priorities of Gender Equality and Africa*
- *Challenges*
 - Decrease in interest among youth in studying STEM - not just a gender problem
 - STEM is stereotyped as a male-dominated field, especially “hard sciences” like maths, physics, engineering
 - Need to change mind-sets, communities and gender-role stereotypes about girls and women
 - Need for strong women role-models in STEM that encourage young women to take up a scientific career
 - Women in scientific careers - raising a family while doing research is a large challenge



Millenium Development Goals (MDGs)

- MDGs - an effort to reduce extreme poverty in the world and to lift an estimated 1.2 billion people out of poverty, defined as living on the equivalent of less than \$1 per day.
- Adopted in 2000 by 189 Member States, the MDGs eight anti-poverty targets that the world committed to achieving by 2015. Since the MDGs were adopted in 2000, enormous progress has been made, but more needs to be done.
- MDGs provided a powerful framework for tackling poverty and have galvanized national, regional and global efforts towards promoting human development.
- "The MDGs prove that goal setting can lift millions of people out of poverty, empower women and girls, improve health and well-being, and provide vast new opportunities for better lives." MDG Report 2015



Sustainable Development Goals (SDGs)



Sustainable Development Goals (SDGs)

- **25 September 2015** - 193 Member States adopted the new 2030 Agenda for Sustainable Development, including the [Sustainable Development Goals](#) (SDGs).
- 17 SDGs - all relating to the work in the Natural Sciences Sector
- **SDGs have a more ambitious agenda**, seeking to eliminate rather than reduce poverty, and include more demanding targets on health, education and gender equality. They are universal, applying to all countries and all people. The agenda also includes issues that were not in the MDGs such as climate change, sustainable consumption, innovation and the importance of peace and justice for all.
- For engineering: water management (**goal 6**), access to energy (**goal 7**) and the creation of strong, lasting infrastructure (**goal 9**) and cities (**goal 11**).
- **Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all** - “By 2020, substantially expand globally the number of scholarships available to developing countries... for enrolment in higher education ... engineering and scientific programmes...”
- **Goal 5: Gender Equality**

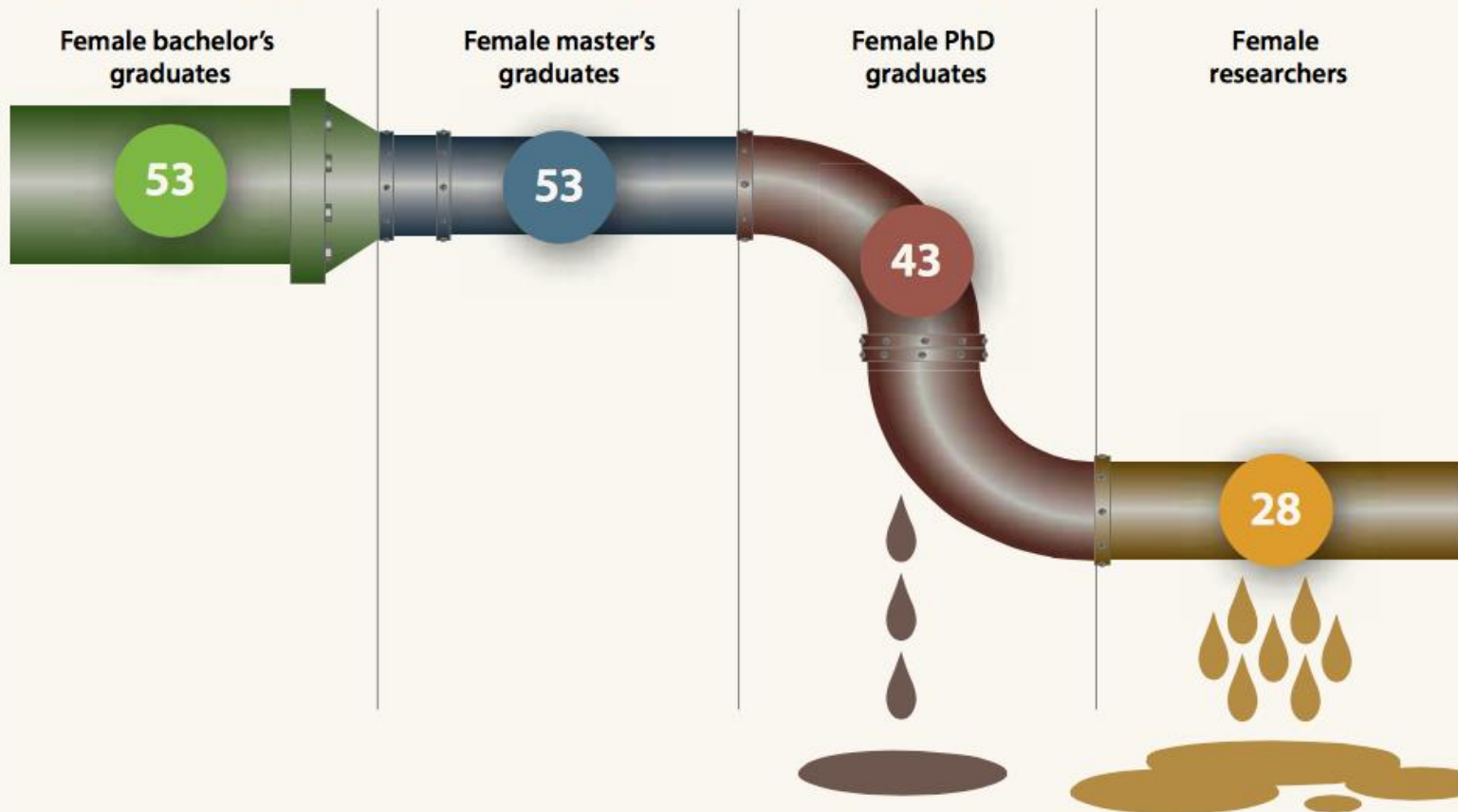
Girls in Science and Engineering

- Around 18% of women in engineering (30% in Science)
- In EU - avg of 16.6% (Latvia 29%, UK 8.5%)
- In USA - avg 20%
- SA has around 12% of women in engineering (Kenya = 10%)
- Strong Role Models (Goodwill Ambassador's, UNESCO-L'Oreal Women in Science)
- Engineering stereotypes change



Women in STEM Research

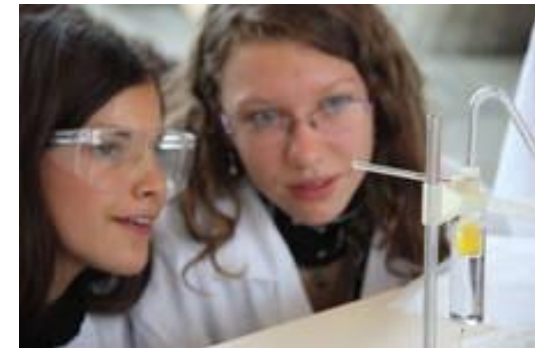
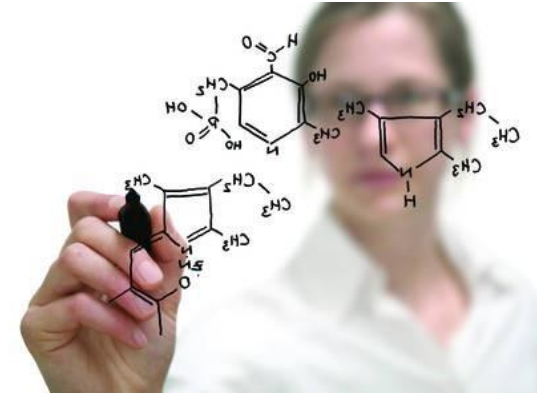
Figure 3.1: The leaky pipeline: share of women in higher education and research, 2013 (%)



Source: UNESCO Institute for Statistics estimates based on data from its database, July 2015

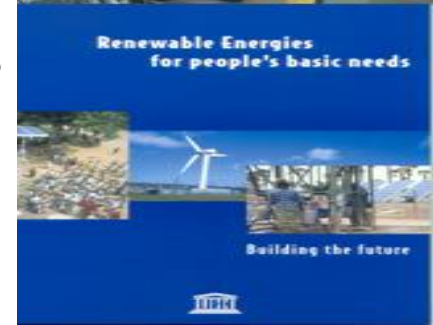
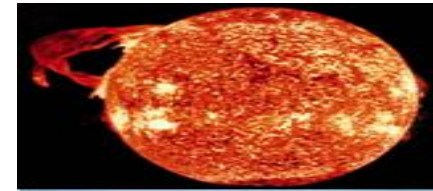
Women in STEM Research

- Women now account for 53% of the world's bachelor's and master's graduates and 43% of PhDs but just 28% of researchers.
- There are also great disparities from one region to another.
 - Southeast Europe - women researchers have obtained parity and,
 - On the verge of doing so in Central Asia and Latin America and the Caribbean - 44%
 - In the European Union, on the other hand, just one in three (33%) researchers is a woman,
 - In the Arab States - 37%
 - Women are also better represented in sub-Saharan Africa (30%)
 - than in South Asia (17%)
- More women graduates in the life sciences > 50%.
- However, in North America and much of Europe, few women graduate in physics, mathematics and computer science but, in other regions, the proportion of women may come close to parity in physics and mathematics.



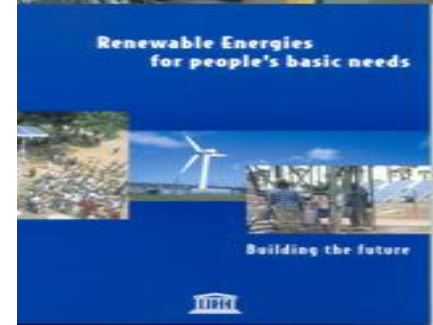
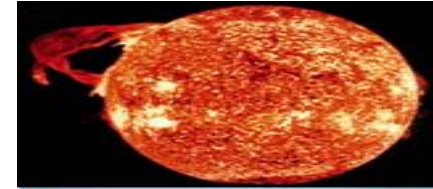
Women in Engineering

- Women are consistently underrepresented in engineering.
 - Europe and North America are generally low: 19% in Canada, Germany and the USA and
 - 22% in Finland,
 - but there are some bright spots: 50% of engineering graduates are women in Cyprus and 38% in Denmark.
- Regional exceptions: share of women graduating as engineers has risen in sub-Saharan Africa, for instance, in the Arab States and in parts of Asia.
 - > 3/10 engineers are women in Viet Nam (31%), Malaysia (39%) and Brunei Darussalam (42%).
- Of the seven Arab countries reporting data, four observe a steady percentage or an increase;
 - the highest scores come from the United Arab Emirates and Palestine (31% each), Algeria (31%) and Oman, with an astonishing 53%



Women in Computer Science

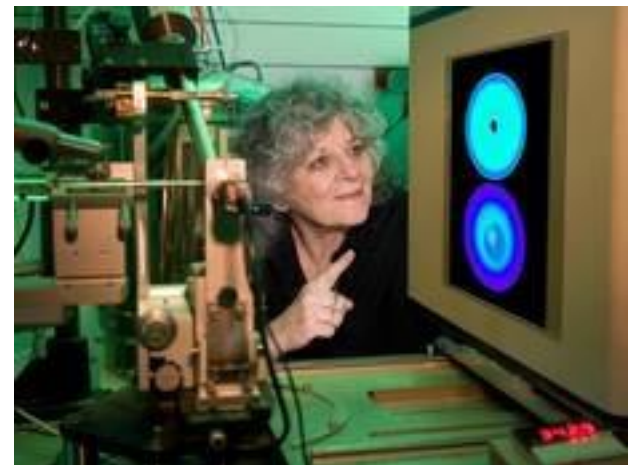
- Computer science shows a steady decrease in female graduates since 2000 - especially high-income countries.
- Exceptions in Europe include Denmark, where female graduates increased from 15% to 24% between 2000 and 2012, and Germany, which saw an increase from 10% to 17%. These are still very low levels.
- The situation in LAC is worrying: in all countries reporting data, the share of women graduates in computer science has dropped by between 2 and 13 percentage points since 2000
- There are exceptions. Turkey, the % women graduating in computer science rose from a relatively high 29% to 33%.
- India - image of engineering changed

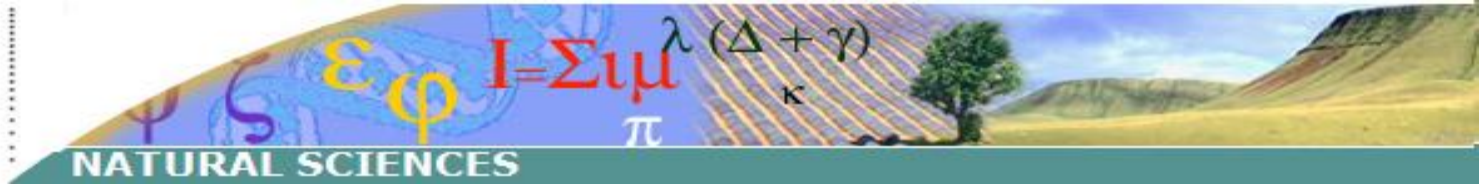


UNESCO-L'Oreal Partnership

Since 1998,

- L'Oréal-UNESCO Awards have recognised more than **87 laureates** from **30 countries**,
 - exceptional women who have made great advances in scientific research.
 - **Two of them have gone on to receive the Nobel Prize.**
- International Fellowships have been granted to more than **2,170 women** in **110 countries**





UNESCO YouthMobile Initiative

- Created in 2014, offers introductory courses in computer programming (learning-to-code) and problem solving (coding-to-learn).
- BY 2017 - to allow at least 25,000 young people to develop the skills to participate in addressing the SDGs in their communities.
- Introduces young people to entrepreneurship and to create viable employment opportunities in the mobile phone industry and ICT Sector

YouthMobile 



UNESCO YouthMobile Initiative

- Implement - “Gender in ICTs” to reduce the gender digital divide, the commitment and heightened motivation of girls to pursue careers in the ICTs sector, the creation of mobile applications by and for women to solve socio-economic challenges, and the integration of gender issues into strategies, policies, programs, projects
- Celebrated on International Girls in ICTs Day - 26 April in Dakar, Senegal
- “...I developed a mobile application for land management in Senegal called SIGESTES. We are all computer programmers with focus on applied business management in ICTs, and studied in Gaston Berger University in Saint Louis, Senegal. This training allowed us to learn about the world of ICTs and encouraged us to become not only consumers of new technology, but producers who innovate and revolutionize.”



UNESCO/INTEL collaboration on STEM Education and Women

- During Mobile Learning Week in February 2015 Intel and UNESCO launched the Young Women in Engineering in Africa Acceleration Programme
- As part of the initiative, young women students in their second year of engineering undergraduate studies in South Africa are provided with a two-year scholarship
 - Mentorship
 - Research at UNESCO Category II Centres in country
- UNESCO and Intel and create an Action Brief intended to serve as a roadmap to guide gender-focused workshops for education policymakers throughout the globe.



Towards Gender Equality in
Education Policies and ICTs
An Action Brief and Toolbox

UNESCO Science & Engineering Fair - Nigeria

- Engineers Without Borders (EWB) UK
- 120 university students trained
- 2000 school pupils, 1500 girls
- 4 experiments:
 - global water situation (Water for the World),
 - adequate housing (Shelter for the World),
 - transportation and its infrastructure (Going the Distance), and
 - hydroelectric power generation (Micro-Hydro).

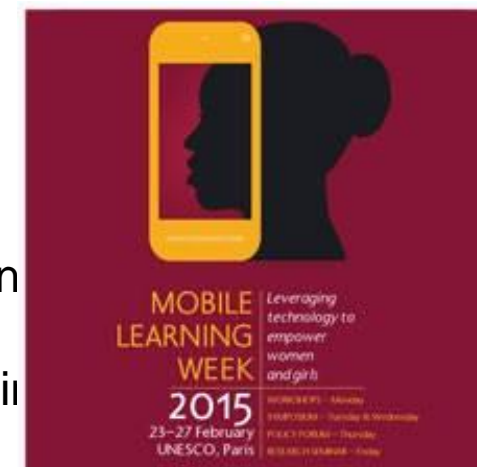


Mobile Learning Week (MLW)

- Mobile Learning Week is UNESCO's flagship ICT in education conference.
- UNESCO Headquarters - the event convenes experts from around the world to share how affordable and powerful mobile technology – from basic handsets to the newest tablet computers – **can accelerate learning for all**, particularly people living in **disadvantaged communities**.
- The Symposium held as part of MLW features numerous breakout presentations from around the world on how to use mobile technology to help women and girls. The event is a snapshot of how people around the world are utilizing technology for gender empowerment.
 - Eg.1: [Uri Ben-Ari](#) explained how his organization is training women teachers in Israel to productively integrate technology in classrooms,
 - Eg. 2: Njideka Harry detailed how her organization helps Nigerian women gain access to banking and financial services via mobile devices. Cumulatively these projects point to a promising future in which personally owned mobile technology can help women surmount the 'digital divide.' Mark West, UNESCO



EFA (2013)



Gender (2015)



United Nations Educational,
Scientific and Cultural Organization

NATURAL SCIENCES

Getting more Women & Girls into ICTs and STEM

To bridge persistently wide gender gaps in technology ownership and use, we should do three things:

- 1) Encourage technology ownership and use by women and girls.
- 2) Ensure that there is no gender bias in technology and devices for girls and boys.
- 3) Ensure that girls and women have role models and mentors in technology fields.
- 4) Develop policies to ensure access and use of ICTs for girls and women while protecting them online.





UNESCO'S 70th Anniversary Celebrations

United Nations
Educational, Scientific and
Cultural Organization

