Highlight: STEM, Women and ICT

What’s at the root of women’s absence in STEM occupations?
Girls and women have made genuine and enormous gains in education and in the labour force over the past half century; but as long as girls continue to tell themselves that they’re no good at math – or science or engineering or any other subject where men have traditionally dominated – even in the face of hard evidence to the contrary, then we’re still losing half of our talent to the destructive power of stereotypes, as stressed in this article published by OECD.

Who are the Tech Age Girls?
The Tech Age Girls (TAG) programme encourages and develops skills of promising young female leaders by providing them with specialized IT training and opportunities to engage in critical public discussion.

News & Events

New research on girls’ transition to STEM in higher education
The latest results from international assessments show that the gender gap in mathematics and science performance is closing between female and male students. But what can be said about girls’ transition to study STEM subjects in higher education?

Five exceptional women honoured for scientific excellence
On March 19th the L’Oréal Foundation and UNESCO presented the L’Oréal-UNESCO For Women in Science awards to five outstanding women scientists. Each woman represents a unique career path combining exceptional talent, a deep commitment to her profession and remarkable courage in a field still largely dominated by men.

Early "Science" is vital for girls
On 12 March, UNESCO Director General Irina Bokova gave the opening remarks and moderated the high-profile side event entitled "Good for equality, good for the economy: Getting Girls into Science, Technology, Engineering and Maths (STEM)", held in the framework of the 58th CSW Session in New York.

International Girls in ICT Day
International Girls in ICT Day is an opportunity for girls and young women to see and experience technology in a whole new light. It is also an initiative backed by ITU Member States to create a global environment that empowers and encourages girls and young women to consider careers in the growing field of information and communication technologies (ICTs). International Girls in ICT day will be observed on 24 April 2014

UNESCO and Samsung announce partnership
UNESCO and Samsung Electronics joined forces to give students in the developing world access to better education. Under a partnership agreement, UNESCO’s education expertise will be combined with Samsung’s Smart School facilities and solutions to support the Organization’s Mobile Learning Initiative.
iCTLT, the International Conference for Teaching and Learning with Technology

iCTLT 2014, the fourth in the series, will be held from 7th April to 10th April 2014 in Singapore. Since the inaugural conference in 2008, iCTLT, the International Conference for Teaching and Learning with Technology, has witnessed vibrant participation with the rich exchange of knowledge and insights amongst educators, researchers, policy-makers and industry partners in the field of educational technology.

Programmes & Projects
STEMNET – Creating opportunities to inspire young people in Science, Technology, Engineering and Mathematics (STEM)

This UK based network provides opportunities for young people to meet inspiring role models in STEM careers, understand real world applications of STEM subjects, and experience hands-on STEM activities that motivate, inspire, and bring learning and career opportunities to life.

Innovative strategies for Andean women’s participation in digital economy
The Asia Pacific Women’s Information Network Center (APWINC) has identified the need for expanding educational and economic opportunities through utilization of ICT to promote Andean women’s participation in digital economy - especially for Peru, Colombia, and Ecuador.

Resources
Girls in STEM and ICT careers: The path toward gender equality

ICTs shape our world. But even though ICTs touch almost every aspect of modern life, girls are steering clear of careers in science and technology at a time when their talent and perspectives might serve as a foundation for IT innovation and improved quality of life potentially for billions of people. This paper takes a look at a crisis that is brewing worldwide, and offers a number of recommendations for getting girls interested in STEM.

Why so few? Women in Science, Technology, Engineering, and Mathematics
AAUW’s 2010 research report Why So Few? Women in Science, Technology, Engineering, and Mathematics presents in-depth yet accessible descriptions of eight key research findings that point to environmental and social barriers — including stereotypes, gender bias and the climate of science and engineering departments in colleges and universities — that continue to block women’s participation and progress in science, technology, engineering, and math (STEM).

Reach Out Toolkit
The Reach Out Toolkit is aimed at managers and coordinators of Science, Technology, Engineering and Maths (STEM) formal and informal education projects. It can help to awake stakeholders’ interest in STEM project results and facilitate their use.
What’s at the root of women’s absence in STEM occupations?
by Marilyn Achiron, Editor, Directorate for Education and Skills, OECD

If you sift through all the education data the OECD has produced over the past year, you’ll come up with decidedly mixed results when it comes to women’s (and girls’) progress. Education at a Glance 2013 told us that gender gaps in educational attainment are not only narrowing, but are, in some cases, reversing, and that women are now more likely than men to enter and complete a university-level programme. Results from the first Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), found that gender differences in the use of information and communication technologies (ICT) have narrowed considerably among 16-24 year-olds, and that, among younger adults, there is, on average, no gender difference in proficiency in numeracy or literacy. In fact, in those countries where there is a difference between young men’s and young women’s levels of literacy, it is young women who score higher.

So, given these data, we have reason to be optimistic.

Unfortunately, this is only part of the story; there are also some other data to consider: Education at a Glance revealed that, among tertiary-educated adults, women still earn less than men (only in Austria, Belgium, Finland, New Zealand, Slovenia and Spain do the earnings of tertiary-educated women amount to 75% or more of men’s earnings; in Brazil, Chile and Estonia, university-educated women earn 65% or less of what similarly educated men earn). What might explain these gender-related disparities in pay?

As the publication also reported, women are still less likely than men to work full time; and 15-29 year-old women are twice as likely as men the same age to be neither in the labour force nor looking for a job. Meanwhile, the Survey of Adult Skills found that in all countries that participated in the survey, similar proportions of men (36%) as women (32%) are proficient in using ICTs. But the survey also found that in 15 of 23 participating countries, men use ICT at work significantly more often than women do – and that the extent to which problem-solving skills are used at work accounts for nearly half the gender gap in wages.

One of the most troubling of findings comes from the PISA 2012 survey of 15-year-old students. Based on information gathered from students through questionnaires, PISA found that, even among the highest-achieving girls (many of whom perform just as well as boys in mathematics), girls have self-sabotaging attitudes towards mathematics: they are more likely to feel anxious towards mathematics, and have less confidence in their own mathematical skills and in their ability to solve mathematics problems than boys.

These attitudes have repercussions later on, as can be seen in other data from Education at a Glance. That publication reports that, in 2011, an average of only 14% of women entering
university-level education enrolled in science-related fields (which include science and engineering) or in manufacturing and construction, compared to 39% of men who entered this level of education in these fields. If so few women aim for the so-called STEM professions (science, technology, engineering and mathematics), there will continue to be few role models in these fields for young girls to emulate, and the cycle will simply perpetuate itself.

What all these data, combined, tell us is that we have no reason to be complacent. The gender gap in students’ self-beliefs about their abilities in mathematics has remained stable in most countries since 2003. In the short term, changing these mindsets may require making mathematics more interesting to girls, identifying and eliminating gender stereotypes in textbooks, promoting female role models, and using learning materials that appeal to girls. Over the longer term, shrinking the gender gap in mathematics performance will require the concerted effort of parents, teachers and society, as a whole, to change the clichéd notions of what boys and girls excel at, what they enjoy doing, and what they believe they can achieve.

Girls and women have made genuine and enormous gains in education and in the labour force over the past half century; but as long as girls continue to tell themselves that they’re no good at math – or science or engineering or any other subject where men have traditionally dominated – even in the face of hard evidence to the contrary, then we’re still losing half of our talent to the destructive power of stereotypes.

Who are the Tech Age Girls?

By Myahriban Karyagdyyeva and Ari Katz, IREX

Tech Age Girls (TAG) are young leaders from eight different countries that have implemented over 400 service projects helping and reaching more than 10,000 people. A Tech Age Girl is tech-savvy, an able leader that can make things happen, and equipped with the necessary skills, support and confidence for 21st century success.

According to a recent ITU report, the European Union calculates that in ten years, there will be 700,000 more Information Communication Technology (ICT) jobs than professionals to fill them; globally, that shortfall is estimated to be closer to two million. But access to the internet and tech careers continues to remain unequal and even in high income countries women only make up 20% of ICT specialists.

For more than 20 years, IREX has pioneered the integration of appropriate technology into development efforts. Through the Tech Age Girls project, implemented since 2005, IREX and its partners engage participants in intensive training in ICT, equipping them with the tools for academic and professional achievement and personal and civic self-expression. Through the
program, participants develop key leadership skills for professional and academic life, ranging from business etiquette to personal time management. Tech Age Girls also meet influential women leaders in their communities and take part in mini-internships during the program.

As of today, over **1,300 girls** have been trained and exercised their leadership and ICT skills through community projects through TAG in eight countries: Uzbekistan, Turkmenistan, Kyrgyzstan, Ukraine, Azerbaijan, Moldova, the Philippines and Vietnam. Each project reaches an average of 30 people and touches on many aspects of community life, including public service, environment, and education. Community projects range in the issues they address. In Kyrgyzstan, a group of five Tech Age Girls trained political party representatives on new communication tools “**I am only 16 years old, but I was able to work with politicians in our country....[After] working with female politicians, I know that politics is not only for men...**” noted one of the trainers, Svetlana Sheiko, a TAG participant in 2011. Angelika Orbeta, a Philippines TAG in 2012 implemented a project which deals with the importance of proper waste disposal and waste segregation in her hometown. Tran Le Khanh Linh, a 2012 TAG from Vietnam, organized trainings on leadership and basic IT skills for 60 of her classmates, while her fellow TAG peer Trinh Hoai Huong trained members of the journalism club at her school on creating digital stories.

**Why does Tech Age Girls work?**

TAG is effective because it works to empower girls within a community of support. Participants are self-selected throughout different stages of the project based on their participation, completion of projects and level of activity. The most dedicated participants are identified through this process and graduate to the final stage of the program. Tech Age Girls connects girls to women role models, places them in internships and plugs them into a vast alumni network and community. Technology is not taught for the sake of technology, but rather used as a tool for empowering girls, building their self-esteem, giving them confidence, and building connections through alumni networking. **”TAG changed me a lot. It made me a more confident girl. It taught me a lot of things...how to manage time, how to use technology, and it helped me to have more friends from everywhere from all over our country.”** Linh, TAG Vietnam.

TAG creates equal opportunities for girls to use ICT in their societies. It is based on the recognition that in order to achieve meaningful success, efforts to improve girls’ potential must go beyond training and start creating an ecosystem in which skills can be maximized. This means addressing leadership and self-confidence, creating support networks, developing allies and advocates, and instilling an understanding of how to assess needs and conceive ways to address them in communities and in the business world.
Myahriban Karyagdyeva (Mehri) is a Program Manager in the Civil Society Division of IREX. She works on a variety of IREX programmes that integrate Information and Communication Technology (ICT) into educational, civil society development and institutional reform programmes in Eurasia.

Ari Katz is a Deputy Director for Technology and Civil Society at IREX. He heads IREX’s team that manages programmes integrating appropriate technology into development strategies.

You can contact the authors here: http://irex.org/contact/new-message.

Further information:

- Tech Age Girls (TAG)
- IREX

Related links:

- New European STEM teacher professional development project
- ITU launches Girls in ICT web portal
- ITU celebrates global ‘Girls in ICT Day’
- Crescent Girls’ School – A FutureSchool®Singapore
- High-level Debate of the ITU: Why are young girls rejecting careers in technology?
- PISA: Are boys and girls ready for the digital age?
- UN debate stresses need to break down barriers for girls in technology-related careers
- At UN-backed gathering, Asia-Pacific leaders urged to give region’s women more access to technology jobs
- Korea promotes e-learning system for women’s career development

Previous issues of the e-newsletter:

- UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?

- Visit our on-line forum and share your views

News & Events

Highlight: STEM, Women and ICT
New research on girls’ transition to STEM in higher education

Despite the narrowing gender gap in mathematics and science performance in secondary education, girls may not be choosing related subjects in higher education, or as a career path.
Indeed, in many countries in the Asia-Pacific, women working in the Science, Technology, Engineering and Mathematics (STEM) Sectors are often a minority. This lack of correlation with female students’ performance in mathematics and science indicates that there may be a number of influential factors at play, which are limiting their future prospects in these sectors.

Indeed, the latest results from international assessments such as PISA in 2012 and TIMMS in 2011 suggest that girls are increasingly ‘catching up’ with boys, especially in science where the gender gap tends to be narrow. In mathematics however, this gap appears to vary from country to country. While generally boys continue to outperform girls albeit by a small margin, for instance in Australia, Indonesia and the Republic of Korea, girls are outperforming boys in mathematics in Kazakhstan, Malaysia and Thailand. The study of STEM subjects in higher education, and an eventual career in those sectors, however, remains largely underrepresented by women. In Malaysia for instance, despite higher performance among girls in mathematics and science in both PISA and TIMSS, studies indicate that women represent only 37.7% of researchers in the science field.

This lack of correlation between girls’ learning achievement, further study and labour market outcomes signals the need for further exploration of the underlying factors that may be affecting this progression, and analysis of how education policies and programmes can help address this gap. As part of a three year joint research initiative between UNESCO Bangkok and the Korean Women’s Development Institute (KWDI) on gender and the quality of education, a multi-country research study will be undertaken to address this gap. This study will be the second in a series of three studies, and will be conducted throughout 2014. It follows from the first study Gender, Jobs and Education: Prospects and Realities in the Asia-Pacific published earlier this year.

Based on an initial desk review of existing research, it would seem that a number of factors may help to explain the lack of correlation. These form the basis of the 2014 UNESCO-KWDI study’s framework. Firstly, the social and cultural context, comprising both social norms and attitudes towards girls and women in these fields, as well as psycho-social factors such as student attitudes, motivation and aspiration towards mathematics and science. Secondly, labour market factors may provide insight into proportions of female graduates entering STEM sectors and those already working in these fields. In addition, employability schemes, programmes and initiatives will be explored to assess how far they reflect gender-sensitivity. Finally the education context will be a key focus, looking at policies, as well as school factors such as teacher attitudes, school activities for enhancing learning in these subjects and career counselling.

This second study will focus on several countries in the Asia-Pacific Region, and in particular the following ten countries: Australia, Cambodia, Indonesia, Japan, Kazakhstan, Malaysia, Nepal, Republic of Korea, Thailand and Viet Nam. This selection of countries aims to not only represent the different sub-regions and social and economic contexts in the region, but also to
better understand how wider sociocultural, labour market and educational factors may be affecting girls’ transition to STEM fields of study in higher education. The research report, which will consist of a regional synthesis based on the findings across the ten selected countries, has just been launched and will be published by the end of 2014. Expressions of interest to participate in this research study in these ten countries can be sent to r.vivekanandan@unesco.org.

For more information, please contact Ramya Vivekanandan [r.vivekanandan@unesco.org] at the Education Policy and Reform Unit

Written by Aliénor Salmon [a.salmon@unesco.org]

Further information:

- Education Policy and Reform Unit (EPR)
- Korean Women’s Development Institut (KWDI)

Related links:

- Report on Gender and Career Perspectives Launched!
- Women in Science
- New European STEM teacher professional development project
- ITU launches Girls in ICT web portal
- ITU celebrates global ‘Girls in ICT Day’
- Crescent Girls’ School – A FutureSchool@Singapore
- High-level Debate of the ITU: Why are young girls rejecting careers in technology?
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- UNESCO "ICT in Education” Announcement e-newsletter

What do you think about this topic?

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Early "Science" is vital for girls
On 12 March, the UNESCO Director-General gave the opening remarks and moderated the high-profile side event entitled "Good for equality, good for the economy: Getting Girls into Science, Technology, Engineering and Maths (STEM)", held in the framework of the 58th CSW Session in New York.

The high-level panelists included UK Minister for Women and Equalities Maria Miller, Anna T. Maembe, Permanent Secretary of the Ministry of Community Development, Gender and Children of Tanzania and Nikki Yates, member of the UK Women's Business Council and UK General Manager for GlaxoSmithKline, a science-led global healthcare company.

The event, organized by the delegations of UK and Tanzania together with GlaxoSmithKline UK, drew a large group of participants, who focused on the under-representation of women and girls in STEM, the role of business and governments in promoting STEM qualifications and careers and the economic impact of the lack of diversity in STEM.

In her opening remarks, Irina Bokova highlighted UNESCO's action to promote STEM education for girls, the l'Oreal-UNESCO Women in Science Program that aims to provide, among other objectives, strong female role models in STEM and UNESCO's work to encourage the participation of women in high-level processes shaping the science agenda and science policies.

In her presentation, Maria Miller highlighted the activities currently underway in the UK to broaden girls' participation in STEM.

Anna T. Maembe presented practical actions taken in Tanzania to involve girls into STEM. While highlighting achievements, she identified certain challenges, such as lack of scholarships for girls to study STEM, lack of mentors to encourage girls and perceptions by girls themselves that science as well as business careers do not pay well.

Nikki Yates provided insights into GlaxoSmithKline's modalities of supporting STEM for girls.

Wrapping up the outcomes of the discussion, the Director-General drew the participants' attention to the importance of girls having scientific understanding as a foundation for empowerment.

Further information:

- Early Science is vital for girls

Related links:

- 16th Annual L’ORÉAL-UNESCO Awards for Women in Science - 2014
- New European STEM teacher professional development project
- ITU launches Girls in ICT web portal
International Girls in ICT Day

International Girls in ICT Day is an opportunity for girls and young women to see and experience technology in a whole new light. It is also an initiative backed by ITU (International Telecommunication Union) Member States to create a global environment that empowers and encourages girls and young women to consider careers in the growing field of information and communication technologies (ICTs). International Girls in ICT Day is celebrated on the 4th Thursday of April every year. This year, it will be observed on 24 April 2014.

The International Girls in ICT Day aims to encourage girls and young women to consider ICT studies and careers. Globally, it is estimated that the world shortfall in skilled ICT professionals exceeds two million.

Despite the obvious benefits, many girls never even consider a career in ICTs. The ICT sector remains a growing sector for employment and a key economic factor underpinning both national and international development in both developed and developing countries. Many countries and regions are predicting a shortage of qualified staff with math, science, engineering and computing skills to meet the growing demand.

At the same time, many companies are looking to increase the number of women in the sector. This means that highly qualified women in technical fields have significant opportunities available to them in both developed and developing countries. The need for qualified professionals in developing countries worldwide should come as no surprise, considering the rate of ICT growth in developing countries.
Why don’t we try to reach even more girls and young women on International Girls in ICT Day 2014?

Further information:

- International Girls in ICT Day

Related links:

- ITU launches Girls in ICT web portal
- ITU celebrates global ‘Girls in ICT Day’
- Crescent Girls’ School – A FutureSchool@Singapore
- High-level Debate of the ITU: Why are young girls rejecting careers in technology?
- PISA: Are boys and girls ready for the digital age?
- UN debate stresses need to break down barriers for girls in technology-related careers
- At UN-backed gathering, Asia-Pacific leaders urged to give region’s women more access to technology jobs
- Korea promotes e-learning system for women’s career development

Previous issues of the e-newsletter:

- UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?

- Visit our on-line forum and share your views

UNESCO and Samsung announce partnership

UNESCO and Samsung Electronics joined forces to give students in the developing world access to better education. Under a partnership agreement, UNESCO’s education expertise will be combined with Samsung’s Smart School facilities and solutions to support the Organization’s Mobile Learning Initiative.

UNESCO Director-General Irina Bokova and Samsung’s Vice President and Chief Corporate Citizenship Officer Seokpil Kim signed the agreement at the Global Education and Skills Forum taking place in Dubai (March 15-17).

“The agreement between UNESCO and Samsung is a shining example of the innovative alliances that are needed to consolidate the foundations of the knowledge societies we need for the 21st century,” Irina Bokova said. “It will help us to integrate the extraordinary power and
reach of mobile technologies into education systems, and provide quality learning for girls and boys, women and men, wherever they may be.”

Samsung Vice President Seokpil Kim said, “At Samsung we see education as the lynchpin that enables all nations to realize their potential to build sustainable and robust societies where people can thrive. Samsung and UNESCO’s shared vision for education and culture will ensure this partnership meaningfully contributes to communities around the world, and will inspire young people to take charge of their own future.”

UNESCO’s Mobile Learning initiative seeks to provide education for all by offering smarter ways to support learning process through mobile devices. The project will enable Samsung and UNESCO to cooperate and make tangible progress in education and will expand further to include culture, the humanities and science.

Samsung is committed to contributing to a better global community through varied initiatives including Samsung Schools that bridge the digital gap and create enhanced educational environment, and Tech Institutes that provide vocational training for students and young technicians.

Samsung and UNESCO have already teamed up on several national projects such as Education for Sustainable Development in Vietnam and the Silk Road Online Platform to preserve knowledge about the history of trade routes.

**Further information:**

- [UNESCO and Samsung announce partnership](#)

**Related links:**

- [Global Education & Skills Forum website](#)
- [Director-General of UNESCO, Irina Bokova](#)
- [Education](#)
- [ICT in Education](#)
- [Mobile Learning](#)
- [UNESCO Mobile Learning Week](#)

**Previous issues of the e-newsletter:**

- [UNESCO "ICT in Education" Announcement e-newsletter](#)

**What do you think about this topic?**

- [Visit our on-line forum and share your views](#)
iCTLT, the International Conference for Teaching and Learning with Technology

iCTLT 2014, a renowned international conference organized by Ministry of Education, Singapore, will be held from 7th April to 10th April 2014. Since the inaugural conference in 2008, iCTLT – the International Conference for Teaching and Learning with Technology – has witnessed vibrant participation with the rich exchange of knowledge and insights amongst educators, researchers, policymakers and industry partners in the field of educational technology.

The last conference, iCTLT 2012, welcomed more than 2,000 local and foreign delegates and exhibitors from 29 countries and more than 100 presentations. Pre-conference activities included hands-on workshops hosted in local schools, mobile learning trails and visits to exciting institutions such as Future Schools@Singapore, edulab@AST and the Classroom of the Future.

iCTLT 2014 hopes to continue the conversations and build on the friendships and networks which were forged during the last conference. All teachers, school leaders, researchers and industry experts from related fields are invited to submit proposals.

iCTLT 2014 Themes:

Enhance Pedagogy
How can we use ICT to enhance pedagogical practices? Proposals under this element should focus on the adoption of technologies to improve instructional methods. This will include but not limited to innovative classroom practices leveraging the use of experimental, emerging or established ICT tools that nurture and assess self-directed learning, collaborative learning and other 21st Century competencies through subject matter.

Engage Learners
How can we engage students to be more active learners with the appropriate use of ICT? This element focuses on harnessing the affordances of technology to enthuse, excite and interest learners. This will include but not limited to authentic educational experiences in ICT-rich learning environments that aim to motivate pupils by making learning more meaningful, relevant and fun for them.

Enable Action
How can we plan for the strategic deployment of ICT in teaching and learning? The focus of this element is on the thought leadership that leads to the effective, efficient and seamless integration of technologies in educational settings with the aim of achieving desirable outcomes. This will include but not limited to policy-making, school administration, cyber wellness, change management and curriculum development.
Empower You

How can we empower educators to use ICT to enhance their teaching, engage their learners and spearhead ICT implementation efforts? The focus of this last element undergirds the intent of the conference. This will include but not limited to professional development through participatory learning approaches, strategies to strengthen teacher accountability, capacity and competencies for the purposeful use of technologies in teaching and learning anytime anywhere.

Learn more by visiting the official event page here.

Programmes & Projects

STEMNET – Creating opportunities to inspire young people in Science, Technology, Engineering and Mathematics (STEM)

These days, we often hear the word STEM education, but what does it really mean for what it stands for? STEM is simply a term referring to the fields of study of science, technology, engineering, and mathematics. It is typically used in addressing education policy and curriculum choices in schools from kindergarten through college to improve competitiveness in technology development, which in turn has a great influence on a country’s social and economic development.

Why does STEM education matter? In fact, STEM education is the key to innovation and economic growth in this digitally connected world, where we are surrounded by technology and innovations, whether they are physical goods such as smartphones, food supplements, performance-enhancing apparel for athletes, or services like mobile banking, online shopping, and video conferencing, which ease the way we work and live our lives. When we look back on the development process of these novel creations, we can see that the groups of people who work hard to make this happen are chemists, biologists, physicists, science researchers, engineers, mathematicians, computer programmers, architects, to name a few, all of whom are professionals in STEM fields. We may not have realized that these groups of people are really important, without them, our society may not have progressed forward as rapidly as it is now. They contribute greatly to a nation’s competitiveness, and economic growth, and social development.

“From a purely economic standpoint, students would benefit from better STEM education because the fields are expanding more quickly than any other besides the health care industry. By 2018, 1 in 20 global jobs will be STEM-related—an estimated 2.8 million jobs in total. Over 90% of those opportunities will require secondary degrees, and over two-thirds will require a bachelor’s degree.” [1]
Therefore, it is critical to build a solid foundation of STEM program, teachers, and resources for development of future STEM workforce for our technology-based economy. Realizing this importance, an educational charity called “STEMNET” or the Science, Technology, Engineering and Mathematics Network was established in 1996 in the United Kingdom, aiming to inspire and encourage UK children to be interested in subjects related to science, technology, engineering, and mathematics, and further continue studying these subjects in schools and colleges. STEMNET provides opportunities for young people to meet inspiring role models in STEM careers, understand real world applications of STEM subjects, and experience hands-on STEM activities that motivate, inspire, and bring learning and career opportunities to life.

In order to do so, STEMNET delivers three core national programs: 1) STEM Ambassadors, 2) STEM Clubs Program, and 3) Schools STEM Advisory Network, connecting young children, schools, and employers together.
STEM Ambassadors are volunteers from a wide range of careers and professions across all ages and background, who contribute their time and support to promote STEM subjects to young learners, teachers, and local communities through various activities such as:

- Giving career talks or helping at career fairs;
- Providing technical advice or practical support to STEM projects in the classroom, explaining current applications of STEM in industry or research;
- Supporting projects in after-school STEM Clubs;
- Speed networking with pupils, parents and teachers;
- Devising or delivering practical STEM experiments or demonstrations; and
- Helping students with mock job interviews. [2]

This is a great way to connect with students and show them the potentials of STEM-related field.

**STEM Clubs Program**

STEM Clubs are any out-of-timetable session that gives students the chance to explore aspects of science, technology, engineering, or math outside their normal curriculum-based classroom activities. STEMNET provides free, impartial, expert advice, and support to schools interested in setting up a STEM Club, which can focus on a single discipline within STEM or be cross-curricular, and counsels the school on designing activities to be aligned with existing national programs and contests or developing a new activity or project to suit the needs of the school and its students.

Activities of STEM Clubs can include practical experiments, investigation, group work, discussion, and reflection. STEM Clubs program is a fun and engaging way to motivate and build confidence in students who struggle with STEM subjects and also provide an extra channel for children who already show aptitude and interests in further learning. [2]

**Schools STEM Advisory Network**

Through STEMNET’s business links and partnerships, STEMNET coordinates with 45 regional and local organizations to form the Schools STEM Advisory Network (SSAN), which offers free, impartial, tailored advice and guidance to help schools and colleges access a range of services, resources, activities, toolkits, and advice, which support the curriculum and increase the number of students moving into further STEM education, training, and development. [2]

STEMNET also links educators with employers, who can help develop the 21st century skills (i.e. creativity and problem-solving ability) for digital economy and employability skills of young people, equipping them with a greater understanding and awareness of STEM careers for their future. When business collaborates with educators in STEM education, together they can identify and help build the skills that are most needed in STEM-driven global economy.
As the name of the organization implies, STEMNET brings together students, educators, and employers together through their STEM network, leveraging on existing expertise, resources, and support from STEM businesses and professionals as they are in the best position to relate real-world applications to students and teachers, and inspire them to further their interest, educational choice, and career path in STEM-related field.

STEMNET is a great example of how different stakeholders can come together as a community to collaborate and contribute to development of education for the next generation. STEM is a key driver in innovation and economic growth, which consequently improves the social well-being and quality of life of the people, as well as global competitiveness of the nations. As Edutopia put it, “STEM knowledge extends beyond a career; it’s knowledge for life.” [3]

Resources:

2. STEMNET, http://www.stemnet.org.uk

Further information:

- STEMNET

Related links:

- Report on Gender and Career Perspectives Launched!
- Women in Science
- New European STEM teacher professional development project
- ITU launches Girls in ICT web portal
- ITU celebrates global ‘Girls in ICT Day’
- Crescent Girls’ School – A FutureSchool@Singapore
- High-level Debate of the ITU: Why are young girls rejecting careers in technology?
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- UN debate stresses need to break down barriers for girls in technology-related careers
- At UN-backed gathering, Asia-Pacific leaders urged to give region’s women more access to technology jobs
- Korea promotes e-learning system for women’s career development

Previous issues of the e-newsletter:
“Innovative Strategies for Andean Women’s Participation in Digital Economy” (2012-2014)

By Asia Pacific Women’s Information Network Center (APWINC), Sookmyung Women’s University (SMU), Seoul, Korea

The Asia Pacific Women’s Information Network Centre (APWINC), an institution for UNESCO Chair in Communication Technology for Women, of Sookmyung Women’s University in Seoul has identified the need for expanding educational and economic opportunities through utilization of ICT to promote Andean women’s participation in digital economy - especially for Peru, Colombia, and Ecuador.

Supported by United Nation Development Programme (UNDP) and Ministry of Science, ICT and Future Planning (MSIP) of Korea, this “Innovative Strategies for Andean Women’s Participation in Digital Economy” is being implemented in collaboration with local partners in both public and private sectors. Partnership has been agreed on with strong commitment of local government, university, and NGOs.

A workshop was held in 2012 in Seoul with aim to share best practices of gender & ICT and to customize training contents. Participants included key personnel who have relevant knowledge and experience from the three countries Peru, Colombia and Ecuador.
To enhance entrepreneurial capacity of young women entrepreneurs and develop institutional empowerment of gender & ICT related organizations, APWINC has conducted research and customized e-business training contents. The contents and educational material are expected to help local trainers to facilitate training on e-business in their language.

The training content composed of six training modules was finalized by local experts. An additional module for basic ICT skills was newly developed by Peruvian professors. The educational material was reviewed by local trainers through training of trainers (TOT). Furthermore, local rural women (entrepreneurs) will be participating in e-Biz Training Replica by the TOT participants from 2013 to 2014.

In order to promote women’s participation in the digital economy by learning ICT and building sustainability of local e-business training for women, this project is expected to make huge
contribution in expanding its beneficiaries to other countries in the Latin America and the Caribbean.

Further information:
- Asian Pacific Women's Information Network Center (APWINC) South Korea

Related links:
- Report on Gender and Career Perspectives Launched!
- Women in Science
- New European STEM teacher professional development project
- ITU launches Girls in ICT web portal
- ITU celebrates global ‘Girls in ICT Day’
- Crescent Girls’ School – A FutureSchool@Singapore
- High-level Debate of the ITU: Why are young girls rejecting careers in technology?
- PISA: Are boys and girls ready for the digital age?
- UN debate stresses need to break down barriers for girls in technology-related careers
- At UN-backed gathering, Asia-Pacific leaders urged to give region’s women more access to technology jobs
- Korea promotes e-learning system for women’s career development

Previous issues of the e-newsletter:
- UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?
- Visit our on-line forum and share your views

Resources

Girls in STEM and ICT careers: The path toward gender equality

This paper, co-authored by Microsoft, UN Women, ITU and UNESCO, takes a look at a crisis that is brewing worldwide, and offers a number of recommendations for getting girls interested in STEM.

It is no secret that the world is increasingly reliant on ICT for social contact, political reform, and commercial enterprise. In the economic sector, many assessments find that broadband penetration is closely linked to a rise in GDP.
Women, meanwhile, have limited access to technology and are underrepresented in the science and technology fields. For example, only 23% of readers who use mobile technology in developing countries are female, according to a new study done by UNESCO, Nokia and Worldreader. And in the United States, only 18% of computer science majors are women, which is a 50% drop compared to thirty years ago. These dismal numbers are reflected in the ICT workforce, where women fill less than one-third of total jobs.

Globally, there are several barriers to women’s access to ICT use and careers. First is the issue of access. In rural areas, countless women are too far from ICT centres or lack the necessary skills. Furthermore, of the planet’s 774 million illiterate people, around two-third are women.

Secondly, social and cultural norms can restrict women and girls’ access to ICT training or use. In the STEM fields, women often face discrimination, stereotyping, and isolation or they do not view these subjects as relevant to their lives.

There are many potential ways to oppose these trends. One possible solution is to build community empowerment centres in places where women have low access to ICT. In schools, creating a new curriculum that trains teachers to respond to girl’s interest in science and technology. Campaigns to promote women as technology content developers can both attract female students and dispel stereotypes about women in tech.

Governments need to adopt comprehensive strategies to increase ICT access and relevance while fighting the “conventional wisdom” about women and technology. These possible responses should be part of holistic policies that remove the obstacles preventing women from using ICT.

Read the publication:

- Girls in STEM and ICT careers: The path toward gender equality

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Previous issues of the e-newsletter:
Why so few? Women in Science, Technology, Engineering, and Mathematics

Women are consistently underrepresented in the STEM (Science, Technology, Engineering, and Mathematics) workplace. The American Association of University Women (AAUW)'s review of the literature “Why so few? Women in Science, Technology, Engineering, and Mathematics” uncovered a range interconnected biases, stereotypes, and pressures that push women away from science and math heavy careers.

Starting in childhood, girls are repeatedly exposed to the idea that “girls can’t do math” and “science is for boys.” Such stereotypes about the innate intelligence of the genders can weigh heavy in the mind of the female student. Though these problems are declining – girls are doing significantly better on standardized math tests than 30 years ago – a significant gap still exists between male and female achievement.

When women do find themselves in a STEM career, they are confronted with a new set of biases. In studies on “masculine” workplaces, people assume women are less competent than an equally qualified man. Or, if the woman is clearly competent and successful, she is viewed as less likable than a male counterpart.

What can be done to challenge the status quo? Educators can help girls recognize that there interest and ability in math and science can become a career. Additionally, they can promote the fact that intellectual skills can be acquired and that hard-work and dedication is the most important factor in strong math and science abilities.

STEM workplaces can make expectations and performance standards clearer in order to assure that women’s successes are properly evaluated. With effort, the gains of women in STEM fields will continue to grow.

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Reach Out Toolkit

The Reach Out Toolkit is aimed at managers and coordinators of Science, Technology, Engineering and Maths (STEM) formal and informal education projects.

It is a practical guide based on the results of a survey and several discussion events with the main target groups active in STEM education carried out in the context of the DESIRE project of the European Schoolnet.

The objective is to help project managers and project coordinators to overcome the dissemination and exploitation challenges of formal and informal science education projects. It can help to awake stakeholders’ interest in STEM project results and facilitate their use.

The main goals are:

• Provide information about the targets of STEM education project and allow to look at diffusion, dissemination and exploitation practices with new eyes.
• Identify obstacles which prevent from achieving a successful dissemination and exploitation of your messages to stakeholders.
• Provide practical tips based on lessons learned and experience from teachers and other STEM education stakeholders.
• Explore how ICT can play a role in achieving your goals
• Highlight approaches which can federate existing initiatives and point to key European or national services that can act as relays for the results of science education projects.

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• Reach Out Toolkit

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