



Toolkit for EU experts

EU-China Seminar: *How to Realise a More Inclusive STEM Education and Increase the Participation of Women*

15-16 October 2024

EUROPEAN COMMISSION

Directorate-General for Education, Youth, Sport and Culture
Directorate C — Innovation, Digital Education and International Cooperation
Unit C.3 — International Cooperation

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EU-China Seminar:

***How to Realise a More Inclusive STEM
Education and Increase the
Participation of Women***

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Welcoming word

Dear Experts,

Welcome to Hangzhou and to the EU-China seminar "How to Realise a More Inclusive STEM Education and Increase the Participation of Women."

We are delighted to have you join us for this special occasion. This event brings together around 40 Chinese and European experts in the field, providing a great opportunity for learning, sharing of experiences and for finding innovative solution to the topic of the event.

Over the next two days you will have the chance to engage in insightful presentations, dynamic discussions, and valuable networking sessions. We encourage you to engage actively, share your insights, and make the most of this platform to forge new connections and partnerships.

Let me also highlight the support through the Erasmus+ program, which has been instrumental in fostering international cooperation and enhancing the quality of education and training across Europe and beyond. Some of you have actively contributing to building knowledge and sharing expertise on STEM and participation of girls through Erasmus+ projects.

Additionally, we acknowledge the significant role of European Schoolnet, a network of 32 Ministries of Education, which supports the transformation of education processes for 21st-century digital societies. European Schoolnet's initiatives help schools and teachers across Europe adopt innovative teaching practices and integrate technology effectively into their classrooms.

We also recognize the contributions of the EU STEM Coalition, which plays a key role in shaping STEM education policies and practices across Europe. By fostering cooperation between national STEM platforms, the EU STEM Coalition helps bridge the gap between education and the labour market, ensuring that students are well-prepared for future challenges.

Furthermore, we want to recognize the important work of researchers, teachers and NGO's dedicated to advancing girls' participation in STEM fields. Your efforts are crucial in promoting gender equality and ensuring that all young women have the opportunity to pursue and excel in STEM careers.

Thank you for being here and contributing to the success of the EU China seminar on "How to Realise a More Inclusive STEM Education and Increase the Participation of Women." We hope you will have a productive and inspiring experience.

Warm regards,

Filip Van Depoele
Head of Unit
Directorate-General for Education, Youth, Sport and Culture
Directorate C – Innovation, Digital Education and International Cooperation
Unit C.3. – International Cooperation

Accommodation details

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Contact persons

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Ms. Diana-Larisa ZAHORTE, EU delegation to China

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Security: Police (English emergency hotline): +86 10 6525 5486
Ambulance: 120

Practical information

Payment Methods: Mobile payment is the most popular way to make transactions in China. The most popular ones are Wechat and Alipay, which you can set up ahead of your trip; while both should in theory work for foreigners, in practice Alipay has proven easier to install to link up with foreign bank cards. Otherwise foreign cards are generally accepted at hotels and some restaurants and shops, but not everywhere. Cash payments are very rare these days in China, but if you only have cash, vendors are not supposed to refuse cash payments.

Taxis: Use ride-hailing apps like DiDi for convenience and safety. If you prefer traditional taxis, have your destination written in Chinese characters, as many drivers may not speak English. If you do not have a local Chinese number, you will not be able to use the DiDi app; instead, you can use the DiDi miniprogram once you have installed Alipay.

Chinese phone number: Installing/using Chinese apps is easier if you have a Chinese phone number; you can purchase local SIM cards in airports or on the website www.trip.com

Communication: Download a translation app to help with language barriers. Pleco is a great app for translating Chinese characters and phrases.

Business Etiquette: Always present and receive business cards with both hands. It's also customary to greet the most senior person first in meetings.

Internet Access: Many Western websites and apps are blocked in China. Consider getting a VPN before you travel to access these services as you will not be able to download a VPN after you arrive in China.

Consular assistance: In case of need for consular assistance, we recommend you familiarise yourself with the consular contact details of your country's diplomatic mission (embassy or consulate) in China.

Draft agenda

Day 1 – Tuesday 15 October Side Visits

08:30-09:50 **Zhejiang Science and Technology Museum**

10:10-12:00 **Hangzhou Guancheng Experimental School**

12:00 **Lunch**

Opening Speeches

9:00-9:30 **15:00-15:30** **First Part**

(CET) **(CST)** **Moderation:** Ministry of Education, China

Speakers:

1. Video Speech by the Chinese representative of HPPD
2. Video Speech by the Commissioner Ivanova (EU)

Second Part

Moderation: China Education Association for International Exchange

Speakers:

1. Speech by a top official of Zhejiang Province, China (TBD)
2. Speech by a high-level representative of the Ministry of Education, China (TBD)
3. Speech by Filip Van Depoele, Head of Unit, International Cooperation Unit, European Commission

9:30-9:35 **15:30-15:35** **Group Photo**

9:35-10:00 **15:35-16:00** **Coffee/Tea Break**

Plenary Sessions

10:00-10:30 **16:00-16:30** **Setting the Scene: Barriers to Girls' Participation in STEM Education: Insights From Research**

Moderation:

Mr. Per Jesper Boesen, Associate Dean Corporation at Jönköping University, Sweden.

Speakers from EU:

1. Ms. Maria Luz GUENAGA GOMEZ, Associate Professor at

University of Deusto

2. Ms. Anna T. DANIELSSON, Professor of Stockholm University

Speakers from China:

1. Mr. Junqing Zhai, Associate Professor of Zhejiang University
2. Ms. Lili Zhang, Professor of Beijing Normal University

10:30-11:05 16:30-17:05 Ignite talks: Inclusive Teaching, Teachers' Training and Involvement of Local Communities

Moderation:

Ms. Xiaomei Yan, Lecturer of School of Education, Shanghai Jiao Tong University

Speakers from China:

1. Mr. Xianqing Bao, Dean of Department of Shanghai Normal University
2. Mr. Feng Zhang, Director of the Evaluation Department of Zhejiang Provincial Institute of Education Examinations
3. Mr. Franky Fan, Director of Beijing Academy of Educational Sciences

Speakers from EU:

1. Mr. Ugo LEENHARDT, eTwinning ambassador and Science teacher at Lycée Andre Malraux, Ecole Nationale, France.
2. Ms. Renāte LUKJANSKA, Chairman of the Board, Social Innovation Centre, Latvia.
3. Ms. Verginiya VESELINOVA, Primary Teacher at 139 Primary School Zaharii Krusha, Bulgaria.

11:05-11:20 17:05-17:20 Coffee/Tea Break

**11:20-12:00 17:20-18:00 European and Chinese Policy Perspectives:
The Role of Systemic, Evidence-Based Policies to Tackle
the Gender Divide in STEM Education**

Moderation:

Mr. Jan LUNDELL, Director of LUMA Centre - A Science Education Network, Finland.

Speakers from EU:

1. Ms. Agueda GRAS VELAZQUEZ, Head of Science Education Department, European Schoolnet.
2. Mr. Leon JURCIC, Senior Adviser at the Education and Teacher Training Agency, Croatia.

Speakers from China:

1. Mr. Zhengfu Li, Associate Researcher of Institute of Curriculum and Textbook Research, Ministry of Education
2. Ms. Shanhui Guang, Director of Center for STEM Education Research of Yao Hai District Education and Sports Bureau, Hefei

12:00-12:30 18:00-18:30 Q&A & Conclusions

Moderation:

Ms. Beatrice Boots, Chair EU STEM Coalition and Director of National Dutch STEM Platform.

13:00 19:00 Dinner

Day 2 - Wednesday 16 October

Side Visits

09:00-12:00 STEM Education and Humanistic Literacy

1. Leifeng Pagoda (historical relic)
2. Zhejiang Intangible Cultural Heritage Museum

12:00 Lunch

Introduction of the Day and Setting the Scene

9:00-9:15 15:00-15:15 Moderation:

Ms. Angela Marietta Cotoara, President of Fundatia Professional, Romania.

Workshops

9:15-11:15 15:15-17:15 Moderation:

Ms. Georgia MANETA, eTwinning Ambassador for Greece, 2nd Primary School Mileon-Kalon Neron, Greece.

Topic 1: *Effective Pedagogies Fostering (Female) Students' Self-Efficacy and Motivation in STEM Education*

Moderation:

1. Mr. Rafael MONTERO, STEM teacher at Colegio Corazón de María, Spain.
2. China

Topic 2: *Combining Formal and Non-Formal Learning Environments to Address the Gender Gap in STEM Education (Opportunities and Barriers)*

Moderation:

1. Mr. Guanghai Guan, Researcher of Zhejiang Provincial Department of Education
2. Ms. Miguela FERNANDES, Teacher at Agrupamento de Escolas da Batalha, Portugal.

Topic 3: *Support for School Leaders, Teachers, and Families to Overcome the Gender Divide in STEM Education.*

Moderation:

1. Mr. Joris VAN MEERHAEGHE, eTwinning ambassador, scientix ambassador and teacher at Don Bosco College,

Belgium.

2. China

11:15-11:30 17:15-17:30 Coffee/Tea Break

Wrap-up and Concluding Remarks

11:30-12:00 17:30-18:00 Moderation:

Ms. Angela Marietta Cotoara, President of Fundatia Professional, Romania **and** Ms. Georgia MANETA, eTwinning Ambassador for Greece, 2nd Primary School Mileon-Kalon Neron, Greece.

Plenary presentations from the different groups done by the moderator at each table.

Concluding Remarks

1. Filip VAN DEPOELE, Head of Unit of European Commission, DG EAC
2. Department of International Cooperation and Exchanges, Ministry of Education, China

List of participants

European Commission

	First name	Last name	Organization	Title
Mr	Filip	Van Depoele	DG EAC, International Cooperation	Head of Unit
Ms	Unni Kvernhusvik	Sagberg	DG EAC, International Cooperation	Desk Officer Asia
Ms	Diana-Larisa	Zahorte	Delegation of the EU to China	First Secretary

EU experts

	First name	Last name	Organization	Country	Flight number	Arrival time
Mr	Per Jesper	Boesen	School of Education and Communication, Jönköping University	Sweden	LH7084	14/10 at 12.45
Ms	Beatrice	Boots	EU STEM Coalition and Platform Talent for Technology (PTVT)	The Netherlands	CZ3783	14/10 at 18.25
Ms	Angela Marietta	Cotoara	Fundatia Professional	Romania	QR890	13/10 at 16.30
Ms	Anna Teresia	Danielsson	Stockholm University	Sweden	LH7084	14/10 at 12.45
Ms	Miguela	Fernandes	Agrupamento de Escolas da Batalha	Portugal	MF8478	14/10 at 11.05
Ms	Agueda	Gras Velazquez	European Schoolnet	Belgium	LH7086	14/10 at 16.45
Ms	Maria Luz	Guenaga Gomez	University of Deusto	Spain	CZ3863	14/10 at 12.20
Mr	Leon	Jurcic	Education and Teacher Training Agency	Croatia	CA1726	14/10 at 21.10
Mr	Ugo	Leenhardt	Lycée Andre Malraux, Education Nationale	France	CZ3523	12/10 at 10.25
Ms	Renāte	Lukjanska	Social Innovation Centre	Latvia	Finnair AY87	10/10 at 18.15
Mr	Jan	Lundell	LUMA Centre - A Science Education Network	Finland	CX958	14/10 at 10.10
Ms	Georgia	Maneta	2nd Primary school Mileon-Kalon Neron	Greece	Egyptair MS953	14/10 at 15.20
Mr	Rafael	Montero Braga	Colegio Corazón de María	Spain	Egyptair MS953	14/10 at 15.20
Mr	Joris	Van Meerhaeghe	Don Bosco College	Belgium	Egyptair MS953	14/10 at 15.20
Ms	Verginiya	Veselinova Rakadjieva	139 Primary school Zaharii Krusha	Bulgaria	CZ3501	14/10 at 17.15

Biographies

Per Jesper Boesen



Jesper Boesen is an Associate Professor of Mathematics Education and currently serves as Associate Dean for Collaboration and Internationalisation at the School of Education and Communication, Jönköping University. Until the summer of 2024, he led the Practice-Based Educational Research environment, which encompassed research on preschool education, mathematics education, and school development. Prior to this, Jesper was the Director of the Centre for Educational Science and Teacher Research at the University of Gothenburg, overseeing 100 doctoral students. His experience also includes a role as Deputy Director of the Swedish National Centre for Mathematics Education. Jesper is actively involved in several European-funded projects as a member of the ICSE consortium, including the GEM project, which focused on increasing girls' interest in STEM and ICT subjects, as well as related studies and career pathways.

Beatrice Boots



Beatrice Boots is the director of Platform Talent for Technology (PTVT), the Dutch national center for technological education and labor market expertise. PTVT connects policy, practice, and science with education, business, and government to promote STEM (including IT) among young people. Their approach emphasizes cooperation between education and business, regional implementation, and increasing female participation in STEM fields. Notable programs include Vakkanjers, Katapult, First Lego League, and Sterk Techniekonderwijs. Beatrice also chairs the EU STEM Coalition, a key network for sharing best practices in STEM education and labor markets across Europe. The Coalition organizes conferences, working groups, webinars, and provides support for new initiatives through policy briefings and roundtable discussions.

Angela Marietta Cotoara

Angela Cotoara is the president of the Professional Foundation in Romania and a teacher of English Language and Literature. As a British Council scholar, she completed five training courses in the UK, enhancing her skills as a Trainer, Teacher Trainer, Mentor, and Mentor Trainer. She has extensive experience in education, both nationally and internationally, including mentoring courses in Latvia, Lithuania, and Romania. Locally, Angela represents Gender Equality at the Mures County Council and serves on the board of QUEST, an associate member of EAQUALS. She is also the Romanian representative of ACWW, an organization supporting women and communities worldwide. For the past decade, she has collaborated with government and civil society organizations to develop gender policies, design training courses, and evaluate the impact of gender equality initiatives. Angela is known for her expertise in methodology and her passion for teaching and training.

Anna Teresia Danielsson



Anna T. Danielsson is Professor of Science Education and Head of the Science Education section at the Department of Teaching and Learning Stockholm University. She is member of the Royal Swedish Academy of Sciences' committee for education. Recent research projects, funded by the Swedish Research Council, have concerned the trajectories of students from under-represented groups to higher education physics and in(ex)clusion in higher education mathematics and physics. Danielsson has published extensively in international journals, primarily on gender and identity perspectives in higher education physics, teacher education, and engineering education. During 2019-2024 she was member of the Swedish Young Academy, an interdisciplinary academy that brings together a selection of the most prominent younger researchers in Sweden. She has previously held appointments at Uppsala University, University of Cambridge and King's College London.

Miguela Fernandes



Miguela Fernandes is a Computer Science teacher for more than two decades, in Agrupamento de Escolas da Batalha, in Portugal, with a Master's degree in Educational Sciences, specialising in Educational Technology. National and International projects coordinator, teacher trainer in pedagogical use ICT, Active Methodologies in the Classroom and other more technical content, online courses organizer and content creator, administrator of Moodle and edX, Ubuntu Academy Trainer, Mindfulness in the Classroom facilitator, Yoga teacher for children and teens, an eTwinning ambassador for 15 since 2007 to 2023, a Microsoft Innovative Educator Expert, CoderDojo responsible, Microsoft Certified Educator, Minecraft Certified Educator and a CCNA 1/2 and IT Essential Cisco instructor and Educational Consultant.

Agueda Gras-Velázquez



Dr Agueda Gras-Velázquez is the Head of the Science Education Department at European Schoolnet (EUN), the network of 30+ Ministries of Education (MoE). She supervises the coordination of all Science, Technology, Engineering and Mathematics (STEM) projects in which EUN is involved. Additionally, Agueda oversees the day-to-day management of Scientix®, the community for science education in Europe and EUN's MoEs STEM representatives Working Group. In her 16 years at EUN, Agueda has been involved in over 70 EC-funded projects and 20+ private funded ones. She has co-authored several papers in Science Education Research and has a PhD in Astrophysics from Trinity College Dublin, Ireland.

Maria Luz Guenaga Gomez



Mariluz Guenaga has a PhD in Computer Engineering (2007). She has been a lecturer at the Faculty of Engineering since 1998 and head of the Deusto LearningLab research group (2011-2019). Her areas of research focus on learning technology, STEM education (specially focused on computational thinking), game-based learning and human computer interaction. From 2015 she is responsible for the Inspira STEAM project (<https://inspirasteam.net/>) devoted to promoting STEM vocations among girls. Other activities related to the promotion of science and technology among youth include: Mariluz is ambassador of the STEM Women Congress, member of the coordination team of Emakumeak Zientzian (Women in Science) initiative and coordinator of the Etorkezuna Argitzen (Lighting your future), a project that aims to improve STEM career counseling for secondary school students. She is also responsible for the STEAM Vocations strategic line of the Engineering Faculty, which comprises all the activities oriented to raise the interest of young people towards technology and engineering. Mariluz is very active in knowledge transfer. She has participated and organized numerous activities (conferences, workshops, trainings, talks, keynotes, etc.) mainly targeted to the educational actors (i.e. school leaders, teachers, students, families) and the society, to promote science and technology, and to bring all her knowledge and experience where it can be useful.

More information: <https://blogs.deusto.es/mlguenaga>

Leon Jurcic



Leon Jurcic is a Senior adviser for physics in Education and Teacher Training Agency, responsible for in-service physics teacher training, licensing, and oversight. In his academic career, he researches topics connected with quantum physics education through University of Ljubljana, Slovenia and Quantum Flagship's QTedu consortium. His fifteen years long science popularization and communication career, both nationally and through various international organizations, as well as teaching experience on all levels of education and research provide a broad insight, which is now helping to advance the policy and recommendations in eliminating any potential systemic issues that could lead to any form of discrimination in STEM courses.

Ugo Leenhardt



Computer engineer degree, Ugo Leenhardt is a technology teacher specialized in education for sustainable development, technological teaching in English within the framework of Etwinning or Erasmus projects, and the taking into account of soft skills and autoregulation in the teaching. He has led numerous STEM-based science projects with groups of girls (10 to 15 y.o) in low-income neighborhoods. Winner of numerous national and international awards, he is recognized for the creation of networks to allow students to learn outside the school and to carry out projects of which they have autonomy.

Renāte Lukjanska



Renate Lukjanska holds a PhD in innovation capacity, specializing in the micro, meso, and macro levels. With over 20 years of experience in EU project development and management, she is a seasoned expert in her field. As the founder and leader of the Social Innovation Centre (SIC), Renate is dedicated to advancing social and educational innovation, with a particular focus on promoting STEM education and encouraging girls to pursue careers in STEM fields. Under her leadership, SIC successfully implemented the AR4STEM project, which utilized augmented reality to create interactive STEM learning experiences and promoted a role model approach to inspire young girls to engage with science and technology.

Jan Lundell

Jan Lundell is a professor of chemistry at the University of Jyväskylä. He has decades of experience in development and implementation of science education and science teacher training.

He has participated in numerous national and international teaching and research evaluation tasks.

Prof. Lundell is the director of LUMA Centre Central Finland, which is one of the 13 regional centres to support formal, non-formal and informal STEM education on all levels of education in Finland. He is the chairman of the board of the LUMA Centre Finland and the chairman of the LUMA Advisory board comprising the core for the Finnish LUMA ecosystem to support children and youth, educators, researchers and working life representatives with issues in STEM education.

Georgia Maneta



Georgia Maneta has been an EFL Educator for over 20 years. She holds a BA in English Language and Literature from the Aristotle University of Thessaloniki, an MA in Literature in English from Dalarna University in Sweden and is in the process of finishing her MSc in Immersive Technologies in Education at the International Hellenic University in Kavala. She has been an eTwinning Ambassador for Greece since 2019. She has been conducting workshops for educators on the use of Web tools and AI tools that facilitate the teaching and learning process. She is responsible for organizing coding and robotics activities in her school and involves her students in various European and International Projects that have to do with culture and technology.

Rafael Montero Braga



Rafael Montero is a STEM Teacher in the Spanish High School Colegio Corazón de María. With a background in Mechanical Engineering and a Master's degree in Mechanical Design his interests lie in raising scientific vocations among his students and increasing the European dimension of his educational community. To that end he has participated in several European level STEM projects (nanOpinion, inGenious, Europeana, Go-Lab, Next-Lab, etc.). He is an official eTwinning, Scientix and Future-Classroom Lab Ambassador for Spain. As European projects coordinator of his school, he has developed and coordinated several Comenius and Erasmus+ projects with many EU countries.

Joris Van Meerhaeghe



Joris Van Meerhaeghe is a lecturer at Don Bosco College DBOC in Flanders Belgium. He is also European eTwinning and Scientix ambassador and part of the think tank internationalisation in Flanders. For over 20 years, he has been teaching in general secondary education for the subjects STEM, science, research and design. From the start of his teaching career, he has been teaching mixed groups of students and has extensive experience in STEM education for girls in GSE. Project-based teaching, applied in an international Erasmus context, is his specialisation.

**Verginiya Veselinova
Rakadjieva**



Verginiya Veselinova is a Primary teacher with over 30 years of classroom experience. She holds a master's degree in education and she is passionate about helping students achieve their full potential. She likes dynamic teaching style including new technologies and challenges. Her current focus is on great diversity of levels and skills of students. She has been working on projects for 18 years - National and European. Her students took part in more than 10 eTwinning projects. She has participated in eTwinning seminars in Billund, Denmark and Lisbon, Portugal. She has participated as a school coordinator in more than 8 projects under the Socrates, Comenius and Erasmus Programme. Currently, she is an Erasmus+ coordinator in 139th Primary school in Sofia, Bulgaria. The school is working on 2 Erasmus projects.

Filip van Depoele



Filip van Depoele is an economist by training (University of Leuven, Belgium) and subsequently studied European Economic Integration (College of Europe, Bruges, Belgium) and International Relations (Johns Hopkins University, Bologna, Italy). He worked for a number of years in the private sector (banking) before joining the European Commission in 1997. Filip held several positions in the Directorate General for Employment and Social Affairs and the Directorate General for Competition before moving to the Directorate General in charge of Education, Youth, Sport and Culture. After having managed the Policy Coordination unit for 5 years, he is currently heading the International Cooperation unit.

Unni K Sagberg



Unni Kvernhusvik Sagberg has a degree from University of Bergen, consisting of French, Law and Political Science. In addition, she spent one semester at l'Institut de Science Politique in Strasbourg as an Erasmus student. She has worked with international relations in higher education since 2005, first at University of Bergen and later at the Norwegian Directorate for Higher Education and Skills. In September 2022 she joined the European Commission as Seconded National Expert in Directorate General in charge of Education, Youth, Sport and Culture where she is in charge of cooperation with Asia.

Chinese participants

	First name	Last Name	Organization	Title
Mr	Xianqing	Bao	Shanghai Normal University	Dean of Department
Mr	Junfeng	Ding	Tongji University	Director of Fab Lab
Ms	Ying	Du	Xi'an Gaoxin Experimental Primary School	Director of the Education Supervision Office
Mr	Franky	Fan	Beijing Academy of Educational Sciences	Director
Mr	Guanghai	Guan	Zhejiang Provincial Department of Education	Researcher Research Office
Ms	Shanhui	Guang	Yao Hai District Education and Sports Bureau, Hefei	Center for STEM education research
Mr	Bin	Guo	Sichuan Provincial Institute of Educational Sciences	Director
Ms	Lei	Li	The Kindergarten of Minghuang Jiayuan in Hefei City	Principal
Mr	Zhengfu	Li	Institute of Curriculum and Textbook Research, Ministry of Education	Associate Researcher
Ms	Wei	Liu	Shanghai Soong Ching Ling School	Vice Principal
Ms	Ying	Lu	Hangzhou Greentown Yuhua Qinqin School	Principal
Ms	Carol	Qin	Intel China Ltd.	Director of Education Industry
Ms	Yinzi	Shen	Jilin Academy of Educational Sciences	Director of the General Office
Mr	Wuquan	Song	Huzhou University	Director of the General Office
Ms	Yaqiong	Wang	Shenzhen Xinsha Primary School	Director of teaching and discipline
Ms	Xiaomei	Yan	Shanghai Jiao Tong University	Lecturer of School of Education
Ms	Xiaoya	Yu	Beijing Institute of Education	Professor
Mr	Junqing	Zhai	Zhejiang University	Associate Professor
Ms	Lili	Zhang	Beijing Normal University	Professor
Mr	Feng	Zhang	Zhejiang Provincial Institute of Education Examinations	Director of the Evaluation Department
Ms	LiLi	Zhang	China Women's University	Academic Leader
Ms	Shengli	Zhang	Jilin Academy of Educational Sciences	Director
Ms	Fei	Zheng	UNICEF	Gender programme specialist

Background note

Context

The Seminar is a follow-up of the the High-Level People-to-People Dialogue in 2024, which took place on 27 March 2024, co-chaired from EU side by Commissioner Iliana Ivanova. The event will bring together experts from the EU and China to exchange ideas and share practices on the topic, while exploring barriers to girl's participation in STEM; systemic, evidence-based policy responses; as well as educational practice proven as effective. Such practices may include for instance gender-sensitive and inclusive teaching methods; interdisciplinary, integrated approaches combining STEM and non-STEM disciplines, with hands-on, engaging activities; adequate teacher training; support for families; involvement of local communities, as well as offering diverse learning environments combining formal, non-formal and informal learning.

The objectives of this seminar:

- Share ideas and good practices that promote women's interest and participation in STEM and learn from each other.
- Identify and discuss policy measures and practices proven as effective in tackling gender inequalities in STEM education.
- Elaborate on possible policy actions aiming at closing the gender gap in STEM education from an early age and across all school educational levels.

The outcomes of the seminar will be summarised in a report prepared by the European Commission after the event, and they will inform EU policy making in the field of STEM education.

Background

STEM education in the EU and gender inequalities

The [European Education Area](#) promotes the development of key competences for lifelong learning through high-quality and inclusive education systems. Mathematical competence and competence in science, technology, and engineering (STEM) is one of the eight key competences for lifelong learning, as defined in the [2018 Council Recommendation setting up an EU key competence framework](#). In interplay with other key competences, knowledge, skills, attitudes in STEM are essential for each citizen to thrive in the complex, technology driven contemporary world, to navigate the twin digital and green transitions and cope with societal change. Interdisciplinary STEM competences are also crucial to preserve European innovation and competitiveness at the global arena, as well as strengthening active and responsible citizenship in democratic processes.

According to the recent evidence, in Europe, the difference in academic achievement among 15-year-old female and male students is rather insignificant, (with a general decline in mathematics and science performance among school students in most of the EU countries though¹). Women also continue to earn university degrees at a higher rate than men. But they hold just one-quarter of jobs in STEM-related professions, and in addition women in STEM employment tend to abandon their jobs, especially in fields

¹ According to PISA 2022, at EU level, the underachievement rate now reaches 29.5% in mathematics and 24.2% in science (vs 22.9% and 22.3%, in 2018). Underachievement is much more frequent among disadvantaged students. In addition, the results of the Trends in International Mathematics and Science study (TIMSS 2019) show that students' interest in STEM subjects declines, as they move from primary to secondary school.

dominated by men.² These are findings from the recent report: [Addressing the gender gap in STEM education across educational levels](#) (2024), which aims to systematically identify and analyse the factors at individual, contextual and institutional levels that contribute to the gender gap in STEM education. This includes aspects such as societal attitudes, educational practices, curriculum design and the role of educators in shaping gender perceptions and choices in STEM. Understanding these factors is crucial to developing targeted interventions.

According to research, girls often show lower self-efficacy in STEM subjects compared with boys, despite achieving similar or better academic performance. This suggests that confidence plays a crucial role in girls' decisions to pursue STEM further. In addition, family and the broader societal context are highlighted as playing a vital role in shaping girls' decisions regarding STEM education and careers. Early exposure to STEM, supportive environments and the overcoming of societal stereotypes are essential to maintaining girls' interest in STEM fields. Barriers at the level of educational institutions, including curricula that are not gender-inclusive, teaching practices that reinforce stereotypes, and a lack of female role models in STEM, contribute to the gender gap. Gender-sensitive and inclusive teaching methods and innovative pedagogical approaches including problem-based learning and interdisciplinary teaching designed to increase girls' engagement in STEM through hands-on, real-world applications are identified – among others – as strategies to enhance girls' participation in STEM.

In the 2024-2029 political President von der Leyen guidelines announced the STEM Education Strategic Plan. One of the goals of this initiative is to “bring more girls and women into STEM education and careers.

The gender gap in STEM education in China

China belongs to the 10 top performing countries in PISA study, which examines the academic achievement of 15-year-olds in mathematics and science. In China, divergence based on gender towards STEM or humanities occurs more from high school and beyond, while below that level there are not noticeable difference. At high school level, the ration of boys to girls would be around 60%:40%. There exists a stereotype in society that boys in general would be better at science than girls.

China is currently in a large-scale campaign to orient more of its youth – regardless of gender – towards STEM studies and it relates to China's goal of becoming a technological, self-reliant country, with an innovation driven economy. For this national goal, it needs the adequate pool of human resources. Therefore, the reorientation towards STEM, including by diminishing enrolment in humanities majors, aims at ensuring the next generation of talent for the national economic and development goals.

² Even though women continue to earn university degrees at a higher rate than men in certain STEM fields (e.g. biology), they hold just one-quarter of jobs in STEM-related professions (Fondazione Deloitte, 2022). Male STEM graduates enter STEM-related employment at a rate twice that of female graduates (European Institute for Gender Equality, 2017). In addition, according to data from Eurostat (2014, 2022), women predominantly earn degrees in fields such as health and welfare, while men are more likely to graduate in disciplines relating to engineering, manufacturing, technology, science and mathematics, and to be employed in these fields. Furthermore, when women enter STEM employment, they tend to abandon their chosen fields of specialisation, especially in those fields dominated by men (UNESCO, 2017).

Research shows that fewer than one in 10 students across Europe graduate in a field related to natural sciences, mathematics or statistics (Eurostat, 2022). More recent data confirm that many of the current labour shortages in Europe are in STEM, and these are likely to increase considerably (ESDE, 2023) due to new STEM job openings. This trend is also evident in Eurostat employment data (2022), which show a 2.5 % increase in the number of people employed in science and technology in 2022 compared with the previous year.

