JUEMUN 2024

Japan University English Model United Nations

Background Guide
Meeting Room 3: STEM Education

Dear Delegates,

Welcome to the 2024 Japan University English Model United Nations (JUEMUN). We are pleased to welcome you to the United Nations Educational, Scientific and Cultural Organization (UNESCO). This year's Secretary Generals are Miki Taguchi and Sayaka Katayama. Miki and Sayaka are graduate students at Notre Dame Seishin University. Miki majors in English linguistics, and Sayaka majors in International Communication. We wish you all the best in your preparation and look forward to seeing you at the conference! The topics under discussion for the UNESCO Conference are:

Meeting 1: Green Education

A: Education for Safeguarding Biodiversity
B: Education for Green Production and Consumption
C: Education for Climate Change Resilience
D: Education for the Protection of the Global Commons

Meeting 2: Peace Education

A: Education for Non-Violence and Social Justice
B: Protecting Education Under Attack
C: Education for Victims of Conflict
D: Education for Reconciliation and Peace Building

Meeting 3: STEM Education

A: Ensuring Equitable Access to STEM
B: Improving the Quality of STEM education
C: Providing Vocational and Technical Training for Adults
D: Education for the Development and Ethical Use of Artificial Intelligence

Members of the JUEMUN Secretariat that serve as the “Bureau” in each meeting:

	Meeting 1	Meeting 2	Meeting 3
Committee A	Ares Ngai Yat Nam	Lin Thu Kha Htaik	Fuka Horie
Committee B	Nayuko Iden	Chihiro Namba	Bianca Patricia Walczak Coelho
Committee C	Saaya Kozeni	Yuzu Fukui	Chanikarn Boonyakida
Committee D	Soran Nakawa	Sachika Hotta	Kicka Hashimoto

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An overview of UNESCO

The United Nations Educational, Scientific and Cultural Organization (UNESCO) was established in 1946, and is involved in the Economic and Social Council (ECOSOC), which is one of the UN principal organs. UNESCO has 194 Member States and 12 Associate Members and seeks to strengthen the power of education, science, culture, and information on humanity or moral solidarity to deal with global issues. UNESCO emphasises achieving the Sustainable Development Goals (SDGs) by 2030, particularly by focusing on SDG 4: Education, which seeks to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." To this end, UNESCO also promotes Education for Sustainable Development (ESD). ESD is an educational approach designed to empower students and teachers with knowledge, skills, values, and agency to realise solutions to global issues such as those to be addressed at this conference.

UNESCO Mandate and Functions

UNESCO is strongly committed to global peace and environmental protection, and the promotion of science education, which it recognizes as crucial in fostering innovation, addressing global challenges, and preparing individuals for the demands of the 21st century.

Through various initiatives, UNESCO supports the development of quality peace education programs, teacher training, and educational resources. Its landmark "Recommendation on Education for Peace, Human Rights and Sustainable Development" serves as a key document, outlining a comprehensive framework for integrating peace education into learning at all levels. Ultimately, UNESCO aims to empower individuals with the knowledge, skills, and values needed to become active citizens committed to building a more peaceful and just world.

In addition, UNESCO is committed to environmental protection and climate action, proof of which can be seen in SDGs 14 and 15 (Life Below Water and Life on Land). These goals can be achieved within a wide range of UNESCO educational programmes, in collaboration with other UN organisations, such as the United Nations Environment Assembly (UNEA) and the United Nations Environment Programme (UNEP). After the Resumed Fifth Session of the United Nations Environment Assembly (UNEA-5.2), UNESCO coordinated educational, natural, human-science, and cultural mandates to conserve natural environmental elements associated with land and marine ecosystems.

As a platform for development and cooperation, UNESCO champions the advancement of Science, Technology, Engineering, and Mathematics (STEM). Through various initiatives, they support countries in developing strong STEM education policies, building teacher capacity, and promoting equitable access to STEM learning opportunities, particularly for girls and women.

Key Resolutions / Conventions for the Conference Theme

As mentioned above, one of the key UN resolutions is Education for Sustainable Development in the Framework of the 2030 Agenda for Sustainable Development. More general sources about UNESCO are also listed below.

Basic Research Sources

- UNESCO in brief
- History of UNESCO
- UNESCO's action in education
- UNESCO's mandate in OER
- Education for sustainable development
- Education 2030
- UIS Statistics - UNESCO

Conference Theme: Education for Sustainable Development

JUEMUN 2024 seeks to address three of the key problems in the world today: Climate Change, a new era of conflict and violence, and issues related to technology. To do this, we will utilise the tools of Education for Sustainable Development (ESD). Okayama, this year's JUEMUN host city, is considered a Regional Center of Excellence (RCE) in ESD.

Education is a basic human right, essential for individual empowerment, social progress, and economic development. It is enshrined within Article 26 the Universal Declaration of Human Rights, adopted by the United Nations in 1948. It further outlines that education should be accessible to all, and promote understanding, tolerance, and peace. The United Nations and its agencies, like UNESCO, continually champion the cause of education as a core requirement for building just and sustainable societies.

ESD is a transformative approach to education that emphasises the interconnectedness of environmental, economic, and social well-being. It fosters the knowledge, skills, attitudes, and values needed to shape a more just and sustainable future for all. As described in UNESCO's Sustainable Development Goal 4.7, ESD aims to ensure that "by 2030, all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development."

To successfully implement ESD, educators must consider a range of complexities. These include the need to shift away from traditional teaching styles towards more participatory and action-oriented learning. Curriculum development should be holistic, weaving together global issues with local realities. Additionally, ESD requires building strong partnerships between schools, communities, businesses, and other organisations to create real-world learning experiences for students.

Best practices in ESD emphasise a focus on critical thinking and problem-solving. Project-based learning, where students actively engage in addressing real-world sustainability challenges, is particularly effective. Importantly, ESD should prioritise inclusivity and respect for diverse perspectives, fostering dialogue and collaboration across cultures and backgrounds to ensure all voices are considered in order to build a sustainable future.

Unfortunately, current educational systems in the world are unequipped, understaffed, and in some cases, under attack. To address this situation, UNESCO has created an Action Education Framework with three functions: Reimagining, Reshaping, and Rebuilding to support all Member States to strengthen their educational systems and empower learners to be creative and responsible global citizens.

Therefore, JUEMUN 2024 aims to create Resolutions for each Meeting Room that focus on educational solutions. To discuss the following agendas, we ask delegates to consider the following questions:

General:

- What are the key issues of each Committee agenda?
- Who is damaged / affected?
- Where does an issue happen / damage occur?
- Why does an issue happen?
- What are UNESCO or other UN organisations doing to resolve the issues?

Education-specific:

- What educational concepts need to be taught that will have a local and global impact?
- By when and at what grade level should these ideas be implemented?
- What educational tools, materials, or resources are needed?
- What teaching methods need to be put into practice?
- What are the needs of educators (e.g. training, support, protection)?
- What are the needs of students (e.g. access, learning disabilities, facilities)?
- How can learning be monitored, assessed, and improved?
- What partnerships need to be built to enhance learning and ensure local development?

Meeting 1 Theme: Green Education

This Meeting Room struggles with issues related to climate change, biodiversity loss, overproduction, and overconsumption, which have been widely documented, and yet, according to UNESCO, over 70% of young people cannot explain what climate change is. In accordance with SDG 12: Responsible Consumption And Production, SDG 13: Climate Action, SDG 14 and SDG 15: Life on Land and Sea, UNESCO proposes a systematic "Green Education" enabling all people to become aware of environmental issues and to develop knowledge and skills to build climate change resilience and safeguard the shared global habitat. This will enable people to become more responsible and sustainable producers and consumers of natural resources. One example is the Okayama ESD Promotion

Commission in Japan, which conducts ESD projects in Community Learning Centers. These are supplemented with visits to local farms, and meetings with local experts to learn about the environment, biodiversity, and sustainable production and consumption cycles. In this way, Green Education can be carried out, and empower the next generation.

Basic Research Sources for Meeting 1

- UNESCO at COP28: Making education the long-term solution to the climate crisis
- Global Commons Stewardship Index 2022
- Climate change education
- Climate Change Education
- Greening every school

Meeting 2 Theme: Peace Education

In recent years, UNESCO has reconfirmed the significance of Peace Education. In line with SDG 16: Peace, Justice, and Strong Institutions, this Meeting Room focuses on the need for peace education for all: proactively preventing conflicts; actively protecting educational institutions and practitioners in danger, and providing care and schooling for victims of conflict; and retroactively promoting reconciliation and peacebuilding. The new Recommendation on Education for Peace, Human Rights and Sustainable Development was adopted by all 194 UNESCO Member States for bringing lasting peace and fostering human development.

Basic Research Sources for Meeting 2

- Education 2030 | #LeadingSDG4 - UNESCO
- Global Coalition to Protect Education from Attack (GCPEA)
- Transformative pedagogy for peace-building: a guide for teachers
- UNESCO's work on education for peace and non-violence: building peace through education
- Educating for peace and the planet

Meeting 3 Theme: Science, Technology, Engineering and Mathematics (STEM) Education

Modern scientific technologies develop quickly. A notable example, AI has become a significant tool globally in the last year. But AI also has the potential to create disinformation and hate speech. AI can be weaponized to threaten world peace, security, and global stability. Therefore at the educational level, students of all ages must be up-to-date on the latest technological tools to properly utilise them to improve quality of life. As a commitment to STEM education, UNESCO promotes SDG 4, particularly subgoals: 4.3 Equal access to affordable technical, vocational, and higher education; 4.6: Universal Literacy and Numeracy; and 4.7: Education for Global Citizenship. In addition, UNESCO calls for the

inclusion of ethics in STEM education to ensure that technology, especially AI, develops as a tool to enhance humanity and not replace it.

Basic Research Sources for Meeting 3

- Global Alliance launched for Science, Technology, Engineering and Mathematics | UNESCO
- New UNESCO report sheds light on gender inequality in STEM education
- Towards an Ethics of Artificial Intelligence | United Nations
- Recommendation concerning Technical and Vocational Education and Training (TVET)
- UNESCO Strategy on technological innovation in education (2021-2025)

Committee A: Ensuring equitable access to STEM

Definitions

STEM **(**Science, Technology, Engineering, and Mathematics) education is becoming increasingly crucial to acquire skills which are necessary for success in life in every type of field. STEM is believed to be an important determinant of achieving not only SDG 4 but also the rest of the Sustainable Development Goals by fostering people to gain innovation and entrepreneurship skills through STEM education and developing solutions that can lift people out of poverty, which greatly contributes to the achievement of SDG 1: No Poverty. Also, STEM education facilitates people to acquire agricultural technology and biotechnology, which enables them to increase food production and sustainability leading to the delivery of SDG 2: Zero Hunger. The development of STEM education is deeply connected to the achievement of the SDGs.

To ensure equitable access to STEM education, all forms of exclusion and marginalisation, disparity, vulnerability, and inequality in education access should be eliminated. Moreover, STEM education should be inclusive and equally provided to everyone by building and upgrading education facilities that are child-, disability-, and gender-sensitive and by providing safe, non-violent, inclusive, and effective learning environments for all.

Facts about the problems and effects

Despite large efforts by UNESCO and other UN organisations, we are still far away from achieving equitable access to STEM, due to gender disparity, rural-urban inequality, income disparity, and many other factors. In Meeting 3, delegates are required to state the factors that cause the disparity in the STEM field and suggest proposals to bridge the gap in STEM. Here are some examples which are the determinants of inequality in STEM fields.

1. **Disparity between developed countries and developing countries**
   Although the right to education is guaranteed for everyone in Article 26 of the Universal Declaration of Human Rights (1948), some Member States have less access to STEM compared to the rest of the world. According to the African Development Bank, less than 25% of Africa's higher education students are in STEM fields. Some of the underlying causes of this problem are identified as poor resourcing, lack of electricity and internet, inadequate STEM education, lack of STEM-related policy.

2. **Geographical disparity**
   According to UNICEF, children and adolescents from rural areas, indigenous and migrant communities, as well as those with disabilities, are among those most likely to miss out on digital learning and are at even higher risk of dropping out of school.

3. **Gender disparity**

Despite the dedication of Member States towards gender equality, many girls and women are particularly underrepresented in STEM education, and consequently in STEM careers. Stereotypes, lack of role models, unconscious bias, and social norms can be some of the reasons for females to keep away from STEM. UNESCO identified the striking gender disparity in STEM from the following data;

- 35% of STEM students in higher education are women
- Less than 30% of researchers in science are women
- 17 out of the 589 Nobel Prizes in STEM were awarded to women.

4. **Income disparity**
   Income inequality is a major barrier to accessing quality STEM education. As SDG 4 Target 4B encourages, many Member States have been working on providing opportunities for young people and adults who have disadvantaged backgrounds, especially financial problems with scholarship programmes. However, the school dropout rates are still high, not just in STEM education but even in primary levels of education.

Action that has been taken

The STEM and Gender Advancement (SAGA) project (2016)

- This project was launched by UNESCO, aiming to strengthen UNESCO's support for gender equality in Science, Technology and Innovation (STI).
- UNESCO seeks to eliminate the existing gender disparity in STI fields, by focusing on four main activities, all of which are related to increasing the transparency of women's contributions in STEM.

Exploring STEM Competencies for the 21st Century (2019)

- This document was published by the UNESCO International Bureau of Education (IBE), which aims to raise the standard, effectiveness, efficiency, and accessibility of education for everyone, by bridging between national and regional administrations and stakeholders.

Science, Technology, Engineering, and Mathematics (STEM) as an Enabler for Development and Peace (2022)

- This policy paper was created by The Office of the Special Adviser on Africa (OSAA), through its Africa Knowledge Network Working Group for STEM to highlight the contribution of STEM education in enabling development.
- It underscores the importance of STEM education for creativity developing solutions and innovations for Africa's sustainable development. It examines the current status of STEM in Africa and explores the implementation level of existing frameworks and strategies in promoting STEM education.

L'Oréal-UNESCO For Women in Science International Awards

- Since 1998, UNESCO and the L'Oréal Foundation have held an award ceremony to recognise outstanding five women scientists every year, one per each of the following regions: Africa and the Arab States, Asia and the Pacific, Europe, Latin America and the Caribbean, and North America. Seven laureates of this award have also received the Nobel Prize.
- Furthermore, UNESCO and the L'Oréal Foundation launched the L'Oréal-UNESCO For Women in Science Programme for promising women scientists.

International Day of Women and Girls in Science

- This day, 11th February, was established in 2015, following the adoption of GA resolution 70/212 signalling the international community's interest in achieving equality and gender parity in science for sustainable development, and recognising that full access and participation in STEM education is important for the empowerment of women and girls.

Cracking the Code: Girls' and Women's education in science, technology, engineering and mathematics (STEM) (2017)

- This is the first report commissioned by UNESCO, documenting the status of gender disparity in STEM fields and achievement in STEM studies of girls and women all over the world.
- This report also provides evidence-based policy and programme guidance which help empower girls and women in STEM fields.

Engendering Access to STEM Education and Careers in South Asia

- Compares trends in South Asia with global trends to examine the effects of how to access and choices of STEM fields on girls' enrollment in education.
- Aims to improve the understanding of obstacles to access and participation in STEM in South Asia, and recommend to enable more girls and women in South Asia to attend STEM fields.

Important resolutions / conventions / treaties

Incheon Declaration

- UNESCO cooperating with UNICEF, the World Bank, UN Population Fund (UNFPA), UN Development Programme (UNDP), UN Women, and the UN High Commissioner for Refugees (UNHCR) organised the World Education Forum 2015 in Incheon, Republic of Korea in 2015 and adopted this declaration aiming to set out a new vision for education for the next fifteen years.
- This statement addresses the necessity of delivering quality education to everyone by strengthening science, technology and innovation and by introducing ICTs into education systems.
- Additionally, it's committed to:

    - Address all forms of exclusion and marginalisation, disparities and inequalities in access to education, and change policies to emphasise people, especially from a disadvantaged background;
    - Provide gender-sensitive policies;
    - Develop inclusive, responsive, and resilient education to meet the needs of people such as those who live in conflict-affected areas and those who are refugees and internally displaced persons.

There isn't a specific resolution/convention/treaty adopted by UNESCO, which solely documents STEM, however, several UN statements address STEM concerning broader goals such as SDGs, gender equality, and the right to education. Additionally, UNESCO regularly publishes reports and strategies regarding STEM, such as;

- The UNESCO STEM Education Strategy 2016-2021
- The UNESCO Science Report

Important research links for committee (country databases, resolutions)

- Gender-responsive STEM education: empowering girls and women for the jobs of today and tomorrow
- The Gender Gap in STEM: Still Gaping in 2023
- #EDUCASTEM2030 | UNESCO
- International Rising Talents | UNESCO

Further research that can develop into policies

While researching this topic, delegates may consider the following questions:

- What initiatives has UNESCO taken to ensure that everyone has equal access to STEM? Also, what further actions UNESCO can provide to eliminate all disparity in STEM fields?
- What kinds of issues related to inequality arise in each Member State's STEM field? And what policies were offered to address the issues?
- What measures can international/regional/national/local communities take to advocate for equal access to STEM?
- While gender equity is one of the most recognized problems regarding access to STEM education, are there any other factors that prevent the development of equal access to STEM?

Committee B: Improving the quality of STEM education

Definitions

Gross Enrollment Ratio (GER) - The entire number of people enrolled in a certain educational level, regardless of age, represented as a percentage of the total population in the official age group associated with that particular level of education. Grade repetition or early or late enrollment might cause the GER to be higher than 100%.

STEM and STEAM education - STEM education is an educational approach that combines science, technology, engineering, and mathematics. Since the arts have the "ability to expand the limits of STEM education and application," they belong in STEAM, its more recent equivalent, based on the STEM Education Guide. According to the Institution for Art Integration and STEM, STEAM aims to increase students' appreciation for practical skills and collaboration by encouraging problem-solving and communication across students.

Facts about the problems and effects

Problems with STEM education:

- **The concept of STEM is relatively new**
- **Lack of curriculum resources**
- **Limited materials**

Member states should be aware that there are substantial obstacles to STEM education, some of which are challenging to overcome in educational settings. Research has identified the following 5 factors as the main obstacles facing educational settings: the influence of tests; school organisation and structure; time restrictions; poor laboratory conditions, and a lack of support for educational systems. There are obstacles for both instructors and students when it comes to imparting knowledge and skills in STEM education. There are two kinds of barriers: those that are uncontrollable, meaning neither the instructor nor the student can alter them, and those that are within our power.

Students' barriers, and challenges:

Member States need to take into consideration the difficulties and obstacles that students face in the STEM education system. Challenges encountered by students revolve around three main categories: course-related challenges, individual challenges, and sociocultural challenges, with the most common being: time management, low motivation, lack of concentration, too many distractions, including depression, financial problems, lack of the right resources, technology-related problems, etc.

To address the difficulties and obstacles that students face when learning STEM subjects, Member States are advised to reevaluate and reform their procedures, methods, and

regulations in schools that provide STEM academic strands by implementing new policies or projects in their countries or in cooperation with other Member States.

Teacher's barriers and challenges:

Teachers, as well as students, encounter a variety of classroom challenges daily. Member States need to review and address these classroom challenges with a special focus on the following areas:

- Understanding different learning styles
- Lack of effective communication
- Keeping up to date with technology
- Communicating with parents
- Pressure from school administrators

The barriers regarding the teachers are connected with the challenges. Delegates need to be able to understand and implement new policies in projects not just to help the students' needs but the teachers' needs as well.

Action that has been taken

STEM Alliance for South-East Europe and the Mediterranean to advance regional STEM education | UNESCO

The STEM Alliance Conference, named "Unleashing the potential of STEM education in South-East Europe and the Mediterranean: STEM Alliance Conference," took place in Venice on November 23–24, 2023, and brought together politicians, education leaders, scientists, academics, educators, and UNESCO Chairs and Centers from 14 countries..

How Christelle Ogo is promoting STEM education for girls in Côte d'Ivoire

Science graduate Christelle Ogo is an advocate for STEM education for women and girls in Côte d'Ivoire. Ogo is committed to advancing STEM education and dismantling obstacles between genders in the scientific community. As a contributor to the initiative "ICT Transforming Education in Africa" in Côte d'Ivoire, UNESCO has acknowledged her efforts by supporting the formalisation of the association, the training of 30 female STEM Ambassadors, and the upcoming awareness-raising campaign aimed at 2,000 young girls in 25 schools nationwide.

UNESCO-UWI Walking in Her Footsteps Summer STEM Tour: Empowering young women to break barriers in STEM | UNESCO

As part of its operations, the UNESCO-UWI Walking in Her Footsteps program (WIHFS), which is targeted at undergraduate STEM students, organised a day excursion to introduce the

girls to people and organisations at the centre of advances in technology in various fields of specialisation.

Important resolutions / conventions / treaties

Management of STEM education is frequently done at the local or national level. However, worldwide initiatives, agreements, and coalitions exist that promote cooperation and teamwork in the field of STEM education. Below are two examples of international initiatives aimed at improving the quality of STEM education.

Global STEM Alliance

The goal of the Global STEM Alliance (GSA) is to equip young people today for employment in STEM fields. With an emphasis on practical instruction, guidance, and personal narratives, the GSA is giving students the tools and role models they need to prepare the workforce and for life.

European Union framework

According to the European Parliament, there will be almost seven million STEM job opportunities in Europe by 2025. However, due to high dropout rates in school and the region's ongoing difficulty in drawing in new learners, there may not be enough qualified candidates to fill these positions. The three-year project NEWTON, financed by Horizon 2020, aims to alter this by using cutting-edge, creative technology-enhanced learning (TEL) techniques and tools to reimagine the learning process and improve results.

Results:

Horizon 2020 has provided funding for several projects that aim to improve STEM education in Europe and beyond.

These programs usually centre on many STEM education-related topics, such as curriculum creation, teacher preparation, student interest and engagement, diversity and inclusion in STEM professions, and the use of cutting-edge technology in the classroom.

Important research links for committees (country databases, resolutions)

- About the Global STEM Alliance | The New York Academy of Sciences (nyas.org)
- Challenges in STEM Learning: A Case of Filipino High School Students - Scilit
- Problems with STEAM Education & How to Solve Them | SAM Lab (samlabs.com)
- The Challenges of STEM Education: Barriers to Participation(acceleratelearning.com) STEM education | UNESCO
- Other policy relevant indicators : Gross enrolment ratio by level of education (unesco.org)

Further research that can develop into policies

Delegates' research should be guided by the following questions:

- How does your Member State implement STEM education?
- In what percent of the education system is STEM used in your Member State?
- How can UNESCO work with UN entities, regional organizations, and Member States to improve the quality of STEM education?
- What are the barriers for Member States to introduce STEM education in the school system?
- How can Member States cooperate with other Member States to improve the quality of STEM education?

Committee C: Providing Vocational and Technical Training for Adults

Definitions

According to UNESCO, **21st-century skills** are a broad set of abilities that enhance ways of thinking, learning, working, and living. These skills include creativity, critical thinking, problem-solving, communication, collaboration, and information literacy. These skills are closely related to **Technical and Vocational Education and Training (TVET)**, a diverse and flexible learning system that provides people with the skills they need for employment. It includes various forms of learning, such as formal, non-formal, and informal, and is designed to prepare individuals for immediate entry into a specific occupation or trade. UNESCO has developed guidelines and resources to support the implementation of TVET, and it monitors the progress of TVET provisions through activities such as policy reviews and capacity development programs. The Recommendation concerning TVET from 2015 lays out general principles and objectives for TVET, covering aspects such as policy and governance, and quality assurance.

TVET programs incorporate 21st-century skills to prepare individuals for lifelong learning, work-based learning, and immediate entry into specific occupations. It provides opportunities for continuing education and caters to individuals at different levels. TVET can address the skills needs of the labor market and requires evidence-based decision-making.

Facts about the problems and effects

The report "***Building Better Formal TVET Systems: Principles and Practice in Low- and Middle-Income Countries***" by the World Bank, ILO, and UNESCO highlights the challenges

confronting TVET programs in low and middle-income countries. The key issues highlighted in the report include:

- Difficulties facing learners, unsupported teachers, and weak incentives for training providers, which contribute to the underperformance of TVET.
- The growing youth population and a significant number of young people, particularly young women, not in education, employment, or training, emphasising the urgency of addressing youth unemployment and skills mismatches.
- Deepening inequalities, a rise in working poverty, and challenges for youth employment, underscoring the critical role of effective skills and lifelong learning systems in addressing these issues.
- Many TVET institutions focus on providing technical skills rather than the cognitive, digital, or entrepreneurship skills needed by students and firms.
- Under-prepared teachers, outdated equipment, and the perception of TVET as a second option further hindering the effectiveness of TVET programs.
- COVID-19 disruption of traditional learning, lockdowns, and social distancing hinder hands-on training, emphasising the need for innovative solutions to ensure effective technical and vocational education.

The report encourages countries to prioritise the needs of learners and enterprises, realign financing to reward reforms and identify quick wins to address these challenges. It also emphasises the potential for leveraging new data and technologies, drawing on lessons from the COVID-19 pandemic, and mobilising private financing to transform TVET systems. Finally, the report underscores that strong TVET systems can help countries meet the Sustainable Development Goals by supporting employment and productivity sustainably and efficiently.

Action that has been taken

UNESCO has taken a leading role in advancing the improvement and broadening of vocational and technical training opportunities for adults through diverse strategic initiatives and programs. The organisation's dedication to this objective is apparent through various important measures and policies.

Adoption of a Comprehensive Strategy

In 2022, UNESCO adopted a far-reaching strategy specifically focused on technical and vocational education and training. This strategy is designed to facilitate learning and career advancement for both young people and adults, highlighting UNESCO's recognition of the importance of providing ongoing educational opportunities for individuals beyond their formative years.

Emphasis on Lifelong Learning

The UNESCO Institute for Lifelong Learning has consistently emphasised the critical importance of lifelong learning for personal fulfilment, societal cohesion, and economic

prosperity. Within this framework, the institute has actively promoted the concept of lifelong learning as it pertains to adult education, including vocational and technical training.

Promotion of Skills for the Evolving Workforce

UNESCO has been proactive in aligning educational offerings with the rapidly evolving demands of the global workforce. This includes a strong emphasis on the development of skills that are pertinent to both professional and personal spheres, with a specific focus on technical and vocational education to ensure that adults are equipped to thrive in a dynamic labour market.

Advocacy for Equal Access to Education

A core pillar of UNESCO's mission is to advocate for equal access to education for all individuals. This principle extends to the realm of technical and vocational training, with UNESCO actively supporting programs that seek to make high-quality training in these areas accessible and affordable for adults from all walks of life.

TVET Systems' response to COVID-19

TVET is valuable in the coping, intermediate, and recovery phases related to COVID-19. It focuses on practical skills for work-based learning and can identify emerging skill needs for economic recovery. This crisis presents an opportunity to strengthen TVET systems and invest in remote learning strategies.

Designing a Contemporary STEM Curriculum

The STEM curriculum teaches STEM practices, such as design, argumentation, and information evaluation. Teacher support notes are available for classroom activities that align with student outcomes. This approach emphasizes practical skills over mere knowledge acquisition and prepares students for future work environments.

Africa Tech School

Africa Tech Schools is a platform that lists technology universities, incubators, and resources for tech education in Africa. It focuses on the growth of tech start-ups and their role in sectors like energy, agriculture, banking, healthcare, entertainment, transport, and fashion. The platform offers market-aligned programs, accelerated learning, community access, and career readiness, with over 4000 enrolled students, 3000 graduates, 300+ employer partners, and an 85% employment rate.

These multifaceted actions collectively demonstrate UNESCO's committed dedication to advancing the provision of vocational and technical training for adults on a global scale, reflecting the organisation's broader commitment to fostering inclusive and equitable educational opportunities for individuals of all ages and backgrounds.

Important resolutions / conventions / treaties

Several agreements, conventions, and treaties have been established to address the changing needs of the workforce and promote vocational and technical education for adults. They guide policy creation and implementation, enhancing job-related training and equipping adults with necessary skills. Here are some key resolutions, conventions, and treaties:

Convention on Technical and Vocational Education (1989)
Adopted by UNESCO, this convention serves as a cornerstone in the realm of technical and vocational education. It highlights the significance of international cooperation and the exchange of information and experiences in the development of technical and vocational education. By advocating for an international legal instrument to strengthen collaboration in this field, the convention lays a solid foundation for advancing vocational and technical training for adults on a global scale.

UNESCO Medium-Term Strategy 2022-2029
In 2022, UNESCO adopted a comprehensive strategy specifically focused on transforming technical and vocational education and training. This forward-looking strategy is designed to facilitate successful and equitable transitions in the face of evolving workforce demands. By placing a strong emphasis on the needs of both youth and adults, this strategy underscores UNESCO's commitment to enhancing vocational and technical training to support individuals throughout their professional journeys.

Technical and vocational education and training (TVET) in Latin America and the Caribbean
Reforms have been implemented to improve the quantity and quality of TVET, including reducing the number of qualifications and adopting a cluster of occupation architecture. Key policy measures for TVET include better anticipation of labour market changes, the development of inclusive learning pathways, and improved governance. Different models of TVET exist, including distinctive TVET, pluralist TVET, and special purpose/marginalised TVET. Overall, the UNESCO Strategy for TVET 2016-21 aims to promote equal access to TVET, relevant skills for employment, and gender equality.

Global conventions and treaties establish principles and frameworks for vocational and technical training, providing adults with access to necessary resources and skills for success in a rapidly changing professional environment.

Important research links for committee (country databases, resolutions)

- Transforming technical and vocational education and training for successful and just transitions: UNESCO strategy 2022-2029
- Convention on Technical and Vocational Education

- Technical and Vocational Education and Training in the Twenty-first Century - new roles and challenges for guidance and counselling. (2002). UNESCO
- What we've been reading: How to improve technical and vocational education and training for youth in developing countries
- Technical and Vocational Education

Further research that can develop into policies

Delegates' research should be guided by the following questions regarding TVET (Technical and Vocational Education and Training) in relation to UNESCO and other UN bodies:

- How does UNESCO support the implementation of TVET globally, and what initiatives or programs does it have in place to address challenges and leverage opportunities in this field?
- In what ways do UN bodies collaborate with Member States to promote TVET in various sectors, and how do they facilitate the development of 21st-century skills through these programs?
- What ethical guidelines or frameworks does UNESCO provide to Member States regarding the use of TVET, and how can countries ensure compliance with these standards to promote ethical practices in vocational education?
- How does UNESCO facilitate cooperation among Member States to enhance the quality and relevance of TVET programs on a global scale, and what mechanisms are in place to foster knowledge sharing and the exchange of best practices?
- What specific recommendations or strategies does UNESCO offer to governments and stakeholders to ensure the effective and ethical utilization of TVET in addressing labour market needs and promoting lifelong learning, aligning with the Sustainable Development Goals set by the United Nations?

Committee D: Education for the Development and Ethical Use of Artificial Intelligence

Definitions

Artificial Intelligence (AI) could be defined as the ability of digital machines or computers to imitate humans in terms of problem-solving skills or decision-making skills. AI has been used in various forms, for example, chatbots, reservations, and in the Information Technology (IT) field. AI could also contribute to developing a more efficient education system in society and address the educational gap. The development and use of AI require nations to create clear regulations and legislation in line with the ethical issues surrounding this technology.

Facts about the problems and effects

2030 Agenda for Sustainable Development recognizes the importance of scientific and technological innovation for human progress. As AI is considered a key factor in building capacities, UNGA resolutions **72/242** and **73/17** recognize technological change can implicate positive and negative for achieving sustainable development. UNESCO calls for a human-centered approach to AI to address current inequalities in terms of access to knowledge, research, and expression. However, the use of AI has its shortcomings, for example, disinformation, job losses, and threats to national security, as stated below. Additionally, there is a fact that while ChatCPT reached 100 million monthly active users in January 2023, only one Member State has released a regulation on generative AI as of July 2023. The lack of AI regulation must be one of the issues of using AI in education. Below more specific education-related AI problems are listed in more detail:

1. **Disinformation**

   AI generates a large volume of convincing disinformation in a variety of media including text as well as imaging, with a very low cost and minor human intervention. AI's use may have the probability of causing misleading or misoperation in important situations in the future. AI's misuse of the information should be addressed to prevent it from being an obstacle to working. The following aspects of disinformation might negatively affect the educational process.

   a. Biased AI: One of the issues of concern regarding AI is biased AI, especially gender-biased or racially-biassed results. Search-engine technology is usually not neutral as it processes data based on user preferences and location, thus it can maintain biases and secure stereotyped information. For example, according to UNESCO's research, an image search of "school girl" will reveal sexualised costumes of girls and women. However, a similar search for "school boys" will reveal images that are not overly sexualised. UNESCO is concerned that AI-processed results may be deeply rooted in social biases, which may have negative consequences for the educational use of AI.

   b. Deep fakes: AI can be used to modify or manipulate pre-existing pictures or videos, creating deceptive images that are difficult to differentiate from real ones. Today, deep fakes still require human intervention to generate high-quality images or videos. Still, AI may generate deep fakes by itself in the future, so it may become out of human control. AI's deep fakes will make it easier for certain actors such as cyber terrorists and cyber criminals to commit unethical, immoral, and criminal acts and spread them over the world without consent. For example, a young celebrity actress became the victim of a deepfake when she found sexually explicit videos with her face on social media and could not delete them. Those are often drafted by an AI algorithm and once posted to the internet, it becomes hard to remove it completely.

c. Lack of transparency and explainability: AI are usually 'black boxes', in that their inner workings are not open to inspection. AI-generated data sometimes does not have any evidence to prove that it is correct and using it in educational research fields as a reference may lack credibility too. For example, in the education field, when AI is asked to make decisions, it cannot track its thinking process, and AI may not always think correctly.

d. Use of information without consent: AI-generated information is often collected from the internet and usually it does not take any owner's permission. Educational use of AI may cause some infringement of privacy and copyright. In addition, data that is already learned by AI is currently impossible to remove, and searching or entering personal data could harm someone's rights. For example, in the past, AI violated privacy laws by collecting photographs of adults and children for mass surveillance and facial recognition without their consent, and for commercial sales. Data collection by AI is one of the remaining issues.

2. **Job losses**

   AI is often thought of as a threat of creating mass unemployment. According to the latest data shown by the UN Department of Economic and Social Affairs (UN DESA), while the population worldwide reaches 9.8 billion people by 2050, 71 million young people are already struggling to find decent employment. As AI develops further, it is clear that AI is a major threat to labour markets. Service sectors are more likely to be impacted by AI, for example, construction, health care, and business according to the UN International Labour Organization (ILO). Education systems must be transformed to adapt to AI or control AI development to not take over human jobs.

3. **Threats on national security**

   Advanced AI systems also pose threats to security and global stability due to their unpredictability. For example, as AI understands biology better, it enables the construction of biological weapons. It may help bad actors to perform cyberattacks or design weapons. AI development efforts should be dedicated to using AI to identify disinformation and misunderstanding among countries' political bodies, which requires education to ensure safety, risk-awareness, fairness, and inclusivity to benefit humanity. Also, education on AI literacy or technology itself must be needed to prevent children from misusing AI or inventing weapons.

Action that has been taken

Creation of the Inter-agency working group on AI (IAWG-AI)

This working group was created at the 40th session in October 2020 of the High-level Committee on Programmes (HLCP) co-led by UNESCO and International Telecommunication Union (ITU) to combine the ethical and technological pillars of the UN, to accelerate progress on the SDGs. The working group aims to provide a solid foundation for

current and future AI development. In March 2021, IAWG-AI had its meeting which approved its terms of reference, and had an additional meeting in September 2021 to develop its work plan.

UNESCO Strategy on technological innovation in education (2021-2025)

This strategy supports Member States in reviewing and developing policies and strategies to harness technology for leveraging in education for the achievement of SDG4. The focus will promote the development and implementation of international standards, frameworks, and ethical principles to govern the development and use of technologies, especially AI in education systems.

Ethical Impact Assessment tool

This UNESCO instrument's goal is: to assess whether specific algorithms are aligned with the values, principles, and guidance set up by the Recommendation, and to ensure transparency by calling for information about AI systems and the way they were developed to be available to the public. The assessments are mandated by the draft EU AI Act for high-risk systems, and they are proposed as part of the Council of Europe's discussion on a Convention for AI.

Important resolutions / conventions / treaties

Recommendation on the Ethics of Artificial Intelligence (SHS/BIO/REC-AIETHICS/2021)

The recommendation addresses ethical issues related to AI within UNESCO's mandate to provide a universal framework of values and actions to guide Member States. It was the world's first and remains its only normative framework on AI internationally. Today, more than 50 Member States are engaging in its implementation and cooperation.

Beijing Consensus on Artificial Intelligence and Education

UNESCO and more than 100 Member States and UN agencies gathered in Beijing from May 16-18, 2019 to review AI's recent trends and its impact on education and lifelong learning systems. The outcome was to recommend governments and other stakeholders in UNESCO's Member States in accordance with their legislation, public policies, and practices, to consider implementing the following actions:

- Planning AI in education policies
- AI for education management and delivery
- AI to empower teaching and teachers
- AI for learning and learning assessment
- Development of values and skills for life and work in the AI era
- AI for offering lifelong learning opportunities for all
- Promoting equitable and inclusive use of AI in education
- Gender-equitable AI and AI for gender equality
- Ensuring ethical, transparent and auditable use of education data and algorithms
- Monitoring, evaluation and research

Additionally, it recommends that international organizations and partners active in the field consider implementing the following actions: financing, partnerships and international cooperation.

※The UN currently has no resolutions on AI, and there are no international conventions or treaties on AI. However, delegates may refer to the document stated below and consider creative policies based on the global recommendation.

Important research links for committee (country databases, resolutions)

- Artificial Intelligence: examples of ethical dilemmas | UNESCO
- Governing AI for Humanity
- Artificial Intelligence – a blessing or a curse for sustainable development? | United Nations
- Ethics of Artificial Intelligence | UNESCO
- Beijing Consensus on Artificial Intelligence and Education
- AI for Good

Further research that can develop into policies

Delegates' research should be guided by the following questions:

- How does your Member State deal with AI? In what sector is AI used in your Member State?
- How can UNESCO work with UN entities, regional organizations, and Member States in education for the development and ethical use of AI?
- What are the barriers for Member States to introduce AI in education in terms of ethical use?
- How can Member States cooperate with other Member States to control AI?
- What steps can governments and stakeholders take to address the wrong use of AI?