Call for expressions of interest to contribute background research to the 2023 GEM Report Regional Report on technology and education in Southeast Asia

Singapore's case study on technology and education

UNESCO is inviting proposals from individuals and organizations for following work assignment.

I. Background

The Global Education Monitoring Report (or GEM Report) is an editorially independent, authoritative, and evidence-based annual report that monitors progress on education in the Sustainable Development Goals (SDGs). The Report is funded by a group of governments, multilateral agencies and foundations and published annually by UNESCO to serve the international community. It is widely recognized as an indispensable technical and advocacy tool supporting the achievement of SDG 4, which aims to ensure “inclusive and equitable quality education” and promote “lifelong learning for all” by 2030.

The 2023 GEM Report, the sixth in this new series, will focus on the role of technology in education. The achievement of SDG 4 is dependent on opportunities and challenges posed by technology, a relationship that was strengthened by the onset of the COVID-19 pandemic. Technology, which appears in six out of the ten SDG 4 targets, affects education through five distinct channels, as input, means of delivery, skill, tool for planning, and providing a social and cultural context. Views on the role of technology are, however, divided, while research is challenged by the breakneck speed of technological developments.

With a view to these debates, the 2023 GEM Report examines education challenges (equity and inclusion; quality; system management) to which appropriate use of education technology can offer solutions. The report then explores system-wide conditions (access to technology, governance and regulation, and teacher preparation) that need to be met for education technology to reach its full potential. To support its research, the GEM Report team also develops country profiles that describe each country’s main laws, policies and programmes on technology, as part of the Profiles Enhancing Education Reviews (PEER) website.

As a complement to the global report and in line with its 2019-2024 strategy, a regional report will examine the opportunities and challenges of education technology in Southeast Asia to better serve its national audiences and promote policy dialogue in the region. The GEM Report team will partner
with the Southeast Asian Ministers of Education Organization (SEAMEO) for the preparation of the 2023 regional report.

SEAMEO is a regional intergovernmental organization established in 1965 among governments of Southeast Asian countries to promote regional cooperation in education, science and culture in the region. Its highest policy-making body is the SEAMEO Council, which comprises the 11 Southeast Asian education ministers. The SEAMEO Secretariat is located in Bangkok. SEAMEO also has 26 specialist institutions located across Southeast Asia that undertake training and research programmes in various fields of education, science, and culture. Each Regional Centre or Network has a Governing Board composed of senior education officials from each SEAMEO Member Country. The Governing Board reviews Centre operations and budgets and sets their policies and programmes.

The regional report will be consistent with SEAMEO’s vision to nurture human capacities and explore its peoples’ fullest potential, making their lives better through quality and equity in education, and information and communication technology, among others. Its seven priority areas include at least four to which information and communication technology can potentially contribute: addressing barriers to inclusion, developing resilience in the face of emergencies, revitalizing teacher education, and adopting a 21st century curriculum.

The report’s strategy outlines our plans to 2024, while this brochure provides a quick overview of our activities.

II. Work and Objectives

The work will focus on the preparation of a case study on technology and education in Singapore. The case study will provide a comprehensive analysis of education technology issues in the country, following the structure of the global and regional report. In particular, instead of taking technology as the starting point, the primary focus will be on the kind of education countries aspire for and the major challenges to fulfil this vision. Only then will the question be asked whether and how technology can help overcome these challenges. Accordingly, the case study will consist of two parts and will examine:

- education challenges to which technology can potentially contribute; and
- essential conditions that need to be met for such a potential to be realized.

It is important to note that, while the experience and lessons from the use of technology during COVID-19 are expected be captured in the case study, the emphasis of the case study must be on the use of education technology in classrooms now that schools are open. The case study should also focus on recent and ongoing efforts and challenges, not on the yet unexplored potential of new and upcoming technologies.

Part I: Education challenges

Education systems all over the world face a range of challenges. Technology could potentially address three major education challenges: equity and inclusion; quality; and system management.

1. Equity and inclusion: access to education

   Education systems, which have struggled to reach several groups of disadvantaged learners, have found in technology a powerful tool to overcome constraints and delivering education to populations who:

   - live in remote areas;
• are affected by conflict and emergencies;
• have a disability or special educational need;
• speak a different language from the language of instruction; and
• are constrained by time

Yet, as the COVID-19 pandemic has shown, the capacity of distance education to ensure learning continuity at system level is challenged, as some disadvantaged populations, for whom technology is meant to provide a solution, are less likely to have access to ICT and more likely to suffer from negative stereotypes, creating digital divides, for instance among:
• girls and women; and
• the elderly

This section will describe how the country is using technology to improve access to disadvantaged groups, with emphasis on the main public policies and programmes – and the challenges faced.

2. Equity and inclusion: access to content
Technology is a tool of access, dissemination, enhancement, replacement and automation. It can be used to locate resources to accomplish an assignment and ensure access to multimodal content. With unlimited storage capacity, web pages and digital readers replace books. But development of high-quality content is costly, particularly for self-paced and asynchronous online courses. ministries of education and schools develop content in various ways, from purchasing materials from international media companies to developing their own content with local universities, media and designers. Ensuring content reaches all learners in more engaging and cheaper formats is a major challenge.

The open education movement has emerged in response to the cost of content and commercialization of previously free content and platforms. Defined by the principle that access to knowledge should be free, open and of high quality for all learners, its most important element is open education resources, in digital or analogue media, that are in the public domain or have been released under an open licence that permits no-cost access, use, resharing, adaptation and redistribution by anyone with no or limited restrictions. Yet despite their advantages, they still face obstacles to large-scale adoption.

This section will describe how the country is using technology to improve access to education content, with emphasis on the main public policies and programmes – and the challenges faced.

3. Quality: basic skills
Disadvantaged learners often fall behind their peers in developing proficiency in basic skills. They may not have enough support at home so arrive in school with limited vocabulary or familiarity with numbers. They may find it difficult to do their homework but, while they need more practice in school, their classes may be too large for their teachers to dedicate to them the time they need. Technology could offer opportunities for more practice, increasing efficiency in the use of classroom time, through hardware (e.g. interactive whiteboards) or software (e.g. closed applications, such as games, puzzles and tutorials, through which students learn ‘from’ the computer, and open applications, such as email, concept mapping, spreadsheets, design programmes, simulators and word processing, through which students learn ‘with’ the computer).

Software can offer exercises that adapt to ability levels, increasingly with the support of artificial intelligence that personalizes learning, can help learners progress at their own pace and encourage them to catch up with their peers. If designed well, software can help students explore various ways of learning that suit their style. Applications can help teachers maintain student motivation and
concentration and bring them to order; receive scripted support; communicate with parents; and carry out multiple routine tasks, such as how to present information, summarize discussions, take notes and annotate texts. But technology is also a potential source of new disruptions in classrooms. A common policy debate is whether mobile phones should be used or banned, in other words, whether their pedagogical use should be promoted or their capacity to distract should be minimized.

This section will describe examples where the country has demonstrably used technology and has managed to improve learning outcomes, notably in reading and mathematics, in primary and secondary education. It will also describe examples where the introduction of technology has not led to the expected results.

4. Quality: digital skills

As technology increasingly permeates daily lives, learners need skills to navigate the digital world and, through them, to explore new ways for developing competency to participate in work, society and politics. Individuals need to critically ‘access, manage, understand, integrate, communicate, evaluate and create information’ for multiple purposes. These competencies include the following:

- **Fight misinformation and disinformation:** Through anonymity, technology helps disseminate views that stoke discrimination, disrespect, hatred and violence, posing a risk to social cohesion.
- **Navigate online services:** To fulfill technology’s potential for networked and distributed learning, through exposure to new ideas, information sources and ways to communicate and collaborate.
- **Create digital content:** Ranging from opportunities for expression to contributions to the teaching and learning process and to advanced skills in coding and programming.
- **Be protected from risks:** Ranging from online abuse to digital identity theft. Technology can have a negative impact on health, happiness and well-being, including from addiction to games, entertainment, information and videos. Soaring screen time reduces outdoor activity and sleep quality; anxiety, obesity and social isolation are on the increase. Attention deficiency is linked to continuous exposure to phones and devices.
- **Learn a range of problem-solving techniques:** To benefit from digital technology.

How education systems approach new and continuously evolving objectives related to technology is a major challenge. They need to assess and anticipate skills needs, develop competence frameworks, issue guidelines, draft curricula, design courses and allocate funds. Textbooks need to be updated more frequently and to become dynamic and interactive. Knowledge on how best to build these skills and competencies is also evolving. Another question is about the right mix between formal, non-formal and informal learning opportunities and how to ensure that individuals can update digital skills throughout their life. If many learners reach proficiency outside school settings, the focus of school activities needs to be reconsidered.

This section will describe how the country incorporates the teaching of these five digital skills in its curriculum, teaching and learning materials, and assessment in primary and secondary education. It will also describe the challenges the country is facing in bringing about these changes.

5. Access and quality: higher education

Higher education institutions, which have been early adopters of education technology, have seen its use generalize during COVID-19. The full range of technologies aimed at improving access, inclusion and quality have been applied but take specific forms when applied to higher education. While the tools are the same as in basic education, their application to higher education has distinct characteristics. They expand connection opportunities, online courses and platforms, collaborative and knowledge sharing tools, interactive exercises, personalized learning opportunities, curricula
and pedagogies, and distance monitoring and assessment. These approaches have facilitated alternative paths to higher education and have opened new possibilities for cross-border education. While it cannot fully substitute for time that needs to be spent in person, for instance doing research in laboratories using specialized equipment, simulators have revolutionized training in some fields of study and have introduced a great degree of flexibility.

This section will describe how education technology has been introduced in universities and other higher education institutions to improve access, equity, inclusion and quality. It will also describe the challenges that these institutions are facing in bringing about these changes.

6. System management
Technology increases opportunities to collect useful education management information. For instance, it can improve resource allocation planning, such as for textbook procurement and distribution, through geographic information systems. Payroll data can be combined with teacher training management. And data collection and verification can be simplified through the use of mobile data.

Technology can also improve data collection and analysis to support education practice, especially through changes to learning assessment, such as automating grading tests, combating plagiarism, storing assessment information to improve classroom practice, and introducing adaptive computer-assisted assessment. New technologies use response speed, answer sequencing and different problem-solving approaches to advance from traditional evaluations of multiple choice questions. Technology also serves in assessing complex skills, such as collaboration. But countries may not be using this rich information sufficiently, effectively and efficiently. They may lack the capacity to draw inference and interpret results from sophisticated assessment solutions. The role of private assessment providers is increasing, beyond certification of digital skills attached to proprietary technology, exerting influence over education policies, curricula and textbooks. Questions over data privacy are being raised.

This section will describe examples where the country has used technology to improve the management of primary and secondary education, notably in resource allocation and learning assessment. It will also describe the challenges the country is facing in bringing about these changes.

Part II: Conditions for fulfilling the potential of education technology

For technology to support education, certain conditions need to be met. Education may not benefit from technology when hundreds of millions of learners lack access to electricity, internet and devices; where there is no regulatory framework to protect them; and where teachers are not prepared to use technology.

1. Availability of technology
All of technology’s promises are of little value if they are only accessible to countries’ richest people and the region’s richest countries. By definition, the diffusion of technology is a gradual process. However, the question of equitable dissemination receives insufficient attention by policymakers. The report will look at how access to technology in education is distributed within and between countries in terms of infrastructure and networks, such as electricity and the internet, as well as the distribution of individual devices such as laptops, tablets and smartphones.

The report will ask questions including what decisions governments need to take, how policymakers access reliable evidence, how finance is ensured, how procurement is organized and how costs of maintenance and replacement are calculated. Policymakers are targeted closely by private providers
through aggressive commercial marketing, direct and indirect, of multiple products. How can they be encouraged not to commit to any one kind of technology and instead commit to intended education outcomes and ask who will be best served and through which technologies? Public policies that promote the provision of technology will be reviewed in terms of their impact on equity, efficiency and effectiveness in education. Specific programmes that aim to compensate for lack of access to technology will also be explored.

This section will describe the country’s major investment decisions in education technology in recent years: what evidence and what process were used to decide on the best options, how was the relevant hardware and software procured and financed, how is this infrastructure maintained, and what measures are governments taking to ensure equitable access. It will also describe the challenges the country has faced.

2. Governance and regulation
Greater availability of ICTs does not depend solely or even mainly on ministries of education. Rather, responsibility is shared between different government sectors, which calls for governance arrangements that ensure alignment and coordination between agencies, authorities and ministries.

As learners increasingly spend their lives online, they also face risks related to content, contact and conduct, which spill over to education. Transparent and participatory methods of governance in the use of education technology are increasingly needed to address these challenges and ensure that the right decisions are being made for the benefit of current and future generations. Legislation and policies to promote standards, regulation and legal protection for privacy, security and safety are being developed. The report will look at the challenges some technologies are posing. For instance, the use of facial recognition technology as a disciplinary device raises questions on consent, the commodification of information and whether such applications are used to control students’ minds and education. Applications of artificial intelligence raise ethical issues and pose potential threats to the right to education.

This section will describe how the country governs education technology with reference to coordinating with other sectors and government agencies. It will list the legislation and regulations that aim to protect learners (safety, privacy, bullying etc.) and their rights. It will also describe the challenges the country has faced in implementing these measures.

3. Teachers
Teachers, as much as learners, face large and increasing demands to engage with technology in education and develop related competencies. Such demands have become more intense with the move to distance learning during COVID-19. Successful technology integration, i.e. routine but thoughtful technology use targeted at improving learning, is tightly linked to teacher practices. It involves a relationship between the teacher, technology use and various personal, environmental, cultural and behavioural conditions or factors within particular professional and organizational contexts.

There are three types of barriers to teachers’ technology use. First, there are barriers concerning teachers’ access to technology. Second, personal factors may impede teachers from using technology, such as lack of capacity and self-efficacy, beliefs over pedagogy, age and personality. Third, lack of support by school leaders and lack of responsive professional development programmes also play a role. Training needs to transform teachers into facilitators of learning through technology, establishing where possible online professional learning communities. Training also needs to extend to head teachers and support personnel.
This section will describe the country efforts to prepare teachers (as well as head teachers and school ICT personnel) to use education technology in classrooms, in particular what are the: competences envisaged; main (presential and distance) initial and continuous professional development programmes; and support mechanisms for teachers. The section will also describe the challenges encountered.

With the support of SEAMEO, the individual expert will liaise with the education ministry and other relevant agency to ensure information is up to date.

Review of PEER country profiles
As mentioned above, the GEM Report team develops country profiles that describe the main laws, policies and programmes on technology and education for each country in the world, as part of the Profiles Enhancing Education Reviews (PEER) website. During the course of this research, the individual expert will receive the 2,500-word country profile from the GEM Report team and will review its quality, making corrections and providing updates where needed.

III. Desired outputs and timeline

Outputs

The Work shall consist of two outputs:

a. A report of approximately **15,000 words** (excluding appendices, annexes, and bibliographies) written in English at a very good level and structured as follows:
   
   1. Introduction and country (500 words)
   2. Education technology and access to education for disadvantaged groups (1,000 words)
   3. Education technology and access to education content (1,000 words)
   4. Education technology hardware and software and improvement of learning outcomes in primary and secondary education (1,500 words)
   5. Curriculum, textbooks and assessment for teaching digital skills in primary and secondary education (1,000 words)
   6. Education technology and higher education (1,000 words)
   7. Major education technology investment decisions in recent years: evidence basis, procurement, financing, maintenance and measures taken to ensure equity in availability of technology (2,500 words)
   8. Governance and regulation of education technology (2,000 words)
   9. Teacher competences and capacity development (2,500 words)
   10. Discussion: main issues on the use of education technology in the country (1,500 words)
   11. Conclusions (500 words)

   Bibliography (with hyperlinks if available online and PDFs if not)

Appendix

b. **Review of a 2,500-word draft PEER country profile** of Singapore developed by the GEM Report team, providing written feedback, corrections and updates, where needed.
The case study and the reviewed profile shall not be circulated or published in any form without prior approval. Once approved, the outputs should specify that work has been prepared for the 2023 regional report on education and technology in Southeast Asia.

**Timeline**

The selected individual expert or organisation shall submit to the GEM Report team for its approval:

1. A first draft of the report by 30 January 2023
2. The final draft of the report and comments on the PEER country profile by 31 March 2023

**IV. Submission of expression of interest**

The GEM Report team hereby invites interested **individuals and organizations** to contribute to the preparation of case studies and PEER profiles to inform the research. The call consists of two parts:

An expression of interest should include:

- A maximum 3-page **technical proposal** including:
  - proposed methodology and workplan (and data, if relevant);
  - brief description of past research experience in this field and in the country/region;
  - a financial proposal.
- **full CVs** of expert(s) involved in the project, including academic record and list of publications, research grants and projects;
- **only for legal entities**: proof of registration as a non-governmental/private organisation including copies of registration certificate(s); please place the proposal on the organisation’s letterhead.

The following are the **selection criteria**:

- Proven research record in the proposed area and in the country/region
- Capacity of the organisation or individual expert to implement the assignment based on the track record and past experiences
- Capacity to draft to a high standard in English

The proposed timeline for reviewing and providing feedback to the submitted contributions is:

- 6 September 2022: Publication of call for expressions of interest
- 30 September 2022: Deadline to submit expressions of interest
- 7 October 2022: Finalization of review of submissions
- 14 October 2022: Notification of outcome and beginning of negotiation for contracting

Commissioning will take place in **October 2022** and case studies and profiles commissioned are expected to be completed by **March 2023**.

Please send your expression of interest in English by **30 September 2022** (midnight Central European time) along with the attachments in one PDF file to Ms Francesca Endrizzi (f.endrizzi@unesco.org), using the subject line **EOI 2023 Southeast Asia Regional Report**. Please also specify in your proposal if you are applying as an individual or an entity.

Any requests for additional information should be addressed in writing by 23 September 2022 at the latest to f.endrizzi@unesco.org. All responses to any queries or clarification requests will be made available to all applicants on the GEM Report website via this [link](#).
Participation to this expression of interest does not guarantee that the organisation or individual expert will be ultimately selected.