Anita Ponne/Shutterstock.com

Introduction

The commitment of the international education community towards meeting the learning agenda as highlighted in Sustainable Development Goal 4 (SDG 4) places a renewed focus on effective learning and a focus on the relevance of learning both for the world of work and civic life. Despite notable strides, an unsettling reality persists: 771 million individuals lack basic literacy skills, while 250 million children remain out of school globally. In Sub-Saharan Africa in particular, fewer than 40% of girls complete lower secondary education, signifying the enduring challenge of educational exclusion and learning poverty.[1] The COVID 19 pandemic has brought discussions about the role of technology in learning to the forefront requiring more and better evidence to support the design of education policies and practices that leverage technology for learning. There is a growing consensus that education systems must change, but there is not yet a clear understanding of what this change could be. The UN Secretary General's Vision Statement on Transforming Education gives some hints by emphasizing the importance of curriculum and pedagogy, and the need for innovation in teaching and learning processes to prepare the learners of today for a rapidly changing world.[2]

Against this backdrop, UNESCO organized an Expert Meeting on the Learning Sciences (25-26 October 2023) to explore and discuss ways to leverage the potential of scientific knowledge about how humans learn to drive innovations and transform teaching and learning practices, as well as to inform policymaking. In essence, the Learning Sciences, referred to as an interdisciplinary area of study that

---

[1] UNESCO Institute for Statistics. https://tcgtest.uis.unesco.org/sdg-4-dashboard/sdg-4-global-dashboard/.

[2] UNITED Nations. https://www.un.org/en/transforming-education-summit/sg-vision-statement.

investigates human learning and development, provide a framework that uses scientific knowledge to understand and explore new ways to enhance the processes and outcomes of teaching and learning.

The meeting spanned over two days. The first day began with a discussion to explore the missing links between the findings from Learning Sciences research and education policies and practices. Following this, two scientific panels presented the latest insights from the Learning Sciences. The first panel explored how the science of learning can mitigate the impacts of poverty and inequity on learning outcomes. The second panel explored pedagogical innovations for improving early and foundational learning. The second day of the meeting was also devoted to experience-sharing among national, regional and global networks working to bridge science, policies and practices in education. The meeting ended with a discussion on partnerships and sustainability.

View the Concept Note

View the Programme

View the Participants List

Emerging insights from the Learning Sciences

Panel 1: How can the science of learning mitigate the impacts of poverty and inequality on learning outcomes?

Chaired by Gregoire Borst (Professor of Developmental Psychology and Cognitive Neuroscience of Education, Université Paris Cité, FRANCE), this panel explored how poverty and inequality, which are causes of poor learning, can be mediated by proximal causes such as hunger, violence, lack of schools and unprepared teachers, among others. These latter factors impact directly on cognitive abilities and brain development, which have consequences on the learning outcomes of children. This session showcased educational interventions informed by the 'science of learning' for improving learning outcomes, especially for vulnerable and disadvantaged children. View the Abstracts.

Kathy Hirsh Pasek (Temple University, USA) presented an approach to teaching and learning that deviates from the traditional 'factory model' of education to one that prepares students to thrive in the 21st century while addressing systemic inequalities. The model employs a developmentally-appropriate pedagogy built on the latest science of learning that capitalizes on how brains learn so that children are more likely to retain and transfer their knowledge. Strategies like guided play and joy are incorporated into learning experiences and highlighted as paths to improve outcomes. In addition to the US context, this new approach to learning is being applied to schools in Vietnam, Japan, Iran, and Ghana. View the slides.

Andrea Chiba (University of California at San Diego and Global Science of Learning Education Network, USA) presented research that explored how the science of learning can provide the knowledge and motivation for designing learning contexts that vary according to the needs of the individual learner. Through a synthesis of discoveries emanating from the science of music and the science of learning, her research explores the possibility of incorporating culturally- and socially-relevant group music programs into school curricula to better support student learning of broad cognitive and pro-social skills such as communication, cooperation, attention, and creativity. View the slides.

Shelley Xiuli Tong (The University of Hong Kong, CHINA) presented new research that utilizes artificial intelligence (AI) technology to diagnose and treat children with developmental dyslexia. Rather than the traditional one-size-fits-all approach to intervention, this new online system leverages the unique strengths of children with dyslexia while improving their specific language and reading skills through a game-oriented learning environment. The intervention, which has been deployed to support Chinese-English bilingual children living in Hong Kong, offers a promising solution by harnessing AI technology

for online diagnosis and intervention of dyslexia for the future of special education aiming to promote more equitable and inclusive education for all families. View the slides.

Bosiljka Milosavljevics (Queen Mary University of London, UK) presented work from a longitudinal study implemented in a rural area of The Gambia to explore the trajectories of neurocognitive development in the context of poverty-related risk to better understand how environmental risk and protective factors impact preschool outcomes. Preliminary findings suggest substantial variation in skills related to early literacy and numeracy, which are precursors to school readiness. Her work underscores the need for educational interventions to begin from infancy, especially for children growing up in disadvantaged contexts. View the slides.

Kaja K. Jasińska (University of Toronto, CANADA) explored the potential of innovative portable neuroimaging technologies to track the neurocognitive development and school readiness of children living in poverty in a rural area of Côte d'Ivoire with high rates of child labour and a high poverty-related risk of illiteracy. Her research explored poverty and its co-occurring risks of low-quality learning environments that impact the typical neurodevelopmental trajectory for literacy. With this understanding, educators can design early screening and intervention programmes to improve the school readiness of vulnerable children. As a result, insights from this research can be leveraged to inform not only educational practices, but also social policies that can strengthen children's potential for success, address inequalities, and improving learning at scale. View the slides.

Panel 2: Pedagogical innovations for improving early and foundational learning.

Chaired by Roberto Lent (UNESCO Chair on Science for Education, Professor of Neuroscience, Institute of Biomedical Sciences, Federal University of Rio de Janeiro and D'Or Institute of Research and Education, BRAZIL), this second panel explored pedagogical innovations to showcase how they must be based on scientific approaches rooted in different types of research, from small experimental controlled studies to large-scale, well assessed, interventions in real classroom contexts. This session explored the 'science of teaching' to address some of the needs for the scientific validation of teaching practices and provide suggestions that may be offered for pedagogical innovation and improvement of teaching practices globally. View the Abstracts.

Ronghuai Huang (UNESCO Chair on Artificial Intelligence in Education, Director of the UNESCO International Research and Training Centre for Rural Education, Beijing Normal University, CHINA) explored how education quality could be improved in low-income contexts through new forms of teaching and learning in digital environments. Based on a pilot study of 12 rural schools in China, the research showed how digital technology can transform learning outcomes by employing evidence-based digital pedagogies to promote self-regulated learning, active learner agency, and cognitive load management – key elements for deep learning. The findings highlight the importance of reshaping teaching in and beyond the traditional classroom to include quality student-teacher interactions, classroom guidance, and competent digital pedagogies. View the slides.

Paul Howard-Jones (University of Bristol, UK) presented his work on transforming teaching and pedagogy at the University of Bristol by introducing the cognitive neuroscience of learning into pre-service teacher training and professional development. His research showed that despite improving teachers' knowledge about research findings in the science of learning, teachers may not apply this knowledge effectively in practice. This is because we lack a Science of Teaching based on experimentation and hypothesis-testing. There is the need to investigate the depth and diversity of teaching, how teachers process and use scientific learning concepts, and how these impact their approach to teaching. View the slides.

Sherlyne A. Almonte-Acosta (SEAMEO INNOTECH, PHILIPPINES) explored factors underlying the choice to pursue a career in teaching and the motivations to remain in the profession among teachers in the Philippine context. Her research revealed a mix of internal and external motivating factors. Internal motivating factors for teachers to join and remain in profession included personal interests, commitment to the profession and fulfilment derived from everyday interactions with students.

External factors such as economic considerations, workload, limited career options and unsupportive environments emerged as reasons why teachers would also consider leaving the profession. Understanding teachers' motivations for the profession can help inform the development of future policy initiatives and ensure that these are relevant and responsive to teachers' varied contexts. View the slides.

Pamela Wadende (Kisii University, KENYA) explored the transition from community care to school settings for children aged 3 to 5 years living in two low-income rural communities in Kenya and Zambia. Key findings showed that while children were exposed to an integrated curriculum in community care settings, it was segmented according to subjects in school. In community care, children played Indigenous learning games and sat on mats, but in school children were often required to immediately sit in upright chairs. The disconnect between care practices in the community and schools often disorients children resulting in poor school performance. The findings revealed the need for better collaboration between caregivers and teachers, and for better integration between community care and school settings to ease the transition for young children. View the slides.

Ximena González Grandón (Universidad Iberoamericana, MÉXICO) brought attention to the importance of social-emotional learning by exploring emergent contributions from Latin American sociocultural perspectives that start from the assumption that emotions are also historical, collective, and cultural expressions. Based on a study of affective and learning behaviours of teachers and students in Mexico, the findings showed the potential of emotions, narratives, bodily postures, gestures, and tone of voice as valuable pedagogical tools that enable the formation of new affective communities with shared ethics and positive learning behaviours. Educational approaches that incorporate emotions, critical pedagogy and social justice can promote empathy, critical thinking skills and equity in learning environments. View the slides.

Experience-sharing from national, regional and global networks in bridging science, policies and practices in education

The second day of the meeting was devoted to experience sharing and peer learning, followed by a discussion on partnership-building and how future work on the learning sciences can be sustained. One proposal put forth by participants was whether a 'global alliance' that brings together researchers, networks and initiatives in the learning sciences could help to bridge the gap between scientific knowledge and education policies and practices.

Participants representing the following networks and initiatives shared their work, experiences, challenges and lessons learned in brokering science, policy and practice in education:

- SDG 4 High-Level Steering Committee – Functional Area 1: Evidence and Policy

- Global Science of Learning Education Network

- Jacobs Foundation: Education Evidence Labs

- Brazilian Network of Science for Educationhttps://institutoayrtonsenna.org.br/en/

- Ayrton Senna Institute | eduLab21

- UNESCO Global Happy Schools Initiative

- International Association for the Evaluation of Educational Achievement

- SUMMA (Laboratory of Education Research and Innovation for Latin America and the Caribbean

- Education Endowment Foundation

- Centre for Educational Neuroscience

- Education.org

- [US National Science Foundation](#)

- [RESULTS](#)

- [Chartered College of Teaching](#)

- [International Society of the Learning Sciences](#)

- [European Edtech Alliance](#)

- [Concordia University Centre for the Study of Learning and Performance | The Learning Toolkit Plus](#)

- [Babilou Family](#)

The exploration of the nexus between science, policies, and practices unfolded through a multifaceted discourse that drew upon insights from diverse networks spanning national, regional, and global spheres. At its core, these deliberations emphasised the critical necessity for collaboration among researchers, scientists, educators and policymakers. The overarching goal was to seamlessly integrate scientific research into the fabric of educational policies, a task that was acknowledged as fraught with challenges hindering this symbiosis.

Throughout these discussions, recurrent themes surfaced, highlighting the formidable barriers that impede smooth integration. These hurdles encompassed a spectrum of complexities, including bureaucratic entanglements, fragmented networks, and contextual disparities, all of which significantly influence the successful application of educational strategies. To address these impediments, participants agreed to work towards a common voice and a more cohesive approach.

In essence, the discourse resonated with a resounding call for concerted collaborative efforts and the envisaging of a global alliance poised to harmonise existing initiatives. This proposed alliance, firmly rooted in shared objectives and collective commitments, emerged as a potent transformative force capable of steering substantive changes across educational landscapes. Throughout these exhaustive discussions, the resolute aim persisted—a dire need to bridge the gap between science, policies, and practices in education through a synchronised approach and cohesive actions. These deliberations underscored the pressing necessity for streamlined integration and impactful collaboration among stakeholders, underscoring their pivotal role in effecting enduring and substantial changes within the educational domain.

Partnerships and sustainability

The discussion emphasized the need for two-way dialogue among policymakers, educational practitioners, and scientists in bringing education policy, practices and the scientific knowledge about how people learn into alignment and mutually beneficial reinforcement, the sharing of knowledge, networking and strengthening capacity to improve production and uptake of scientific knowledge about human learning for education. Further, it recommended the establishment of a global alliance of networks on learning sciences, that UNESCO facilitates the work of this global alliance by acting as a knowledge broker among policymakers, educational practitioners, and scientists, and that UNESCO represents the global alliance to advocate for and inform the deliberations of global multi-stakeholder consultation and coordination mechanisms in the areas of its expertise and other important high-level global political decision-making processes and mechanisms.

Conclusions and moving forward

An important yet under-exploited wealth of knowledge from Learning Sciences for education policies and practices

The field of Learning Sciences has shown us the wealth of scientific knowledge that can be leveraged for successful learning, and the different ways of learning beyond traditional classrooms. However, it can be challenging to translate this research into policies and practices because scientists and education stakeholders often have different languages and goals. Many initiatives, such as conferences and research networks are working towards bridging this language gap. Organizations like the International Mind, Brain and Education Society (IMBES), the Global Science of Learning Education Network (GSoLEN), and the Network on Education Quality Monitoring in the Asia-Pacific (NEQMAP) are making efforts to begin to integrate scientific knowledge into educational interventions. At UNESCO, the Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP) produced a first-ever report pulling together the most recent scientific knowledge on learning, the International Science and Evidence-based Education Assessment Report. The High-Level Steering Committee responsible for monitoring progress on SDG 4, under the auspices of UNESCO, established a dedicated working group to support Member States on using data and evidence for policy formulation and implementation. These initiatives make it clear that there is a need to bridge these gaps. Especially at country level, there is a disconnect between research, policy implementation and actual practice. The meeting acknowledged the challenges involved in integrating the insights and evidence that are fragmented across different disciplinary lines of research on learning and teaching, and the critical need to overcome these challenges in order to provide useable information in ways that can be taken up by practitioners to improve teaching and learning. It further acknowledged the neglected and unfulfilled potential of using the pedagogical knowledge and classroom experience of teachers and other education practitioners to test and refine theories and to inform future research agendas.

Next steps

1. To take forward the recommendation agreed by experts that UNESCO facilitate the establishment of a global alliance of networks on the learning sciences, UNESCO will prepare a Terms of Reference for such an alliance articulating its objectives, scope of work and working modalities.

2. UNESCO will prepare a publication pulling together the scientific contributions presented at the meeting into a collection of insights for education policies and practices to be released in late 2024.

3. It was agreed among the participants that a follow-up meeting in about one year's time would be a valuable gathering to touch base about new and emerging findings. UNESCO will organize the meeting for late 2024, this time with the inclusion and participation of policymakers and practitioners to enable a two-way dialogue between them and scientists, which was articulated to be one of the key functions of a global alliance.

For more information

Education 2030