REIMAGINING EDUCATION

THE INTERNATIONAL SCIENCE AND EVIDENCE BASED EDUCATION ASSESSMENT

Summary for Decision Makers (SDM)

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ASSESSMENT

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The publication can be cited as: Duraiappah, A.K*., Van Atteveldt, N.M*., Buil, J.M., Singh, K. and Wu, R. (2022) *Summary for Decision Makers, Reimagining Education: The International Science and Evidence based Education Assessment.* New Delhi: UNESCO MGIEP. *Indicates co-first authorship, as authors have contributed equally.

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Summary for Decision Makers (SDM)

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The UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development embarked on the ambitious International Science and Evidence Based Education (ISEE) Assessment in 2019, and in spite of the challenges presented by the COVID-19 pandemic, has since commendably convened over 300 scientists and experts from 45 countries from diverse disciplines. The findings presented in this four-part, 25-chapter publication, will undoubtedly pave the way for policy and decision making for future education systems when now the world needs, more than ever, visions for a future that must be more sustainable, resilient, socially just and fair.

The release of the publication comes at a pivotal point, as the world attempts to return to some sense of normalcy, while grappling with new and evolving variants of the COVID-19 pandemic. The pandemic has threatened to reverse decades of global progress on education and has jeopardized the chances of achieving the United Nations Sustainable Development Goals (SDGs). The World Bank projects that up to 10 million children may not return to school. Additional studies evaluating the effects of the pandemic on our children's education reiterate a need for world leaders to increase education spending and develop strong policy frameworks to scale up quality inclusive and accessible educational technology.

There is little doubt that the kinds of knowledge and skills that will be required of future generations will go beyond the regular "job ready" skills and will necessarily need to include skills such as emotional resilience, empathy and compassion to navigate the increasingly uncertain and rapidly changing, multicultural world. The pandemic provides an opportunity for us all to rethink the purpose of education and reorient curriculum and pedagogy to shape societies where all beings—both human and other forms of life—can flourish.

The ISEE Assessment is a first-of-its kind Assessment that contributes to re-envisioning the future of education to build more resilient and sustainable education systems that can weather crises such as the one we are currently faced with. Key findings from the Assessment point towards an education system where every learner learns differently and is influenced by a complex combination of internal factors and context.

The Assessment also advocates for a whole-brain learner centric approach towards an education for human flourishing, as a key means to achieving the SDG 4, Target 7, which urges governments to equip all learners with "knowledge and skills needed to promote sustainable development".

A truly unique aspect of the Assessment is its multidisciplinary nature – the bringing together of experts from disciplines as diverse as neuroscience, education, philosophy, psychology, data and evidence, sustainability and technology. The ongoing COVID-19 pandemic has shown that most education systems around the world are woefully underprepared to face other future impending crises such as climate change. Experts and scientists from diverse disciplines must come together to resolve the challenges that we face and the ISEE Assessment offers a classic example of how scholars from different sectors can convene to arrive at practical and feasible recommendations towards a more sustainable future.

Furthermore, what is truly distinct about the Assessment is the adoption of the science and evidence based approach, which emphasizes the need for policy makers to adopt scientifically backed decision making approaches for the future.

We were indeed privileged to be involved in the advisory process of the Assessment and congratulate UNESCO MGIEP, the two co-chairs of the Assessment, the co-chairs of the four working groups, the authors, reviewers and all stakeholders involved in the Assessment who came together to produce this unique publication which we are confident will inspire policymakers, educators, education stakeholders and decision makers in their own efforts to address the challenges that our world faces in the years to come.

PREFACE

Stefania Giannini,
UNESCO Assistant Director-General for Education

ASSESSMENT

To build a more peaceful, just and sustainable world tomorrow, we must diagnose the current failings of our development model and mobilize collective intelligence to reimagine our futures together. This was the mission of UNESCO's International Commission on the Futures of Education that published its flagship report in November 2021. Based on wide consultation, it calls for a new social contract for education to rebalance our relationships with each other, technology and the planet. This report sets out a vision for education renewal, inviting Member States to engage in dialogue on transformative actions. What is imperative, in addition to a participatory approach and democratic dialogue, is the need to have rigorous evidence-based science as the foundation for effective policy and decision-making.

Along these lines, I welcome the initiative taken by the UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP) to produce the International Science and Evidence based Education Assessment as a contribution to re-envisioning the future of education. This Assessment, which complements the Futures of Education report, mobilizes multidisciplinary expertise of almost 300 experts from 45 countries in an inclusive and open manner. It takes on board the latest evidence from cognitive sciences that carry impact on how we learn, covering such areas as brain plasticity, coping with emotions and the importance of mother tongue instruction. Such a comprehensive perspective is vital for compiling and connecting cutting-edge research and different knowledge streams around why, what, where and how people learn, informed by science

and a multiplicity of local contexts.

The Assessment provides thoughtful historical insight on how education has evolved over the past 50 years and policy recommendations for change. It asserts that education policies all too often exacerbate inequality and focus too narrowly on knowledge acquisition over a holistic and humanistic approach - one that UNESCO defends and is imperative to cope with today's challenges.
For education to contribute to human flourishing and more inclusive, sustainable and just societies, it has to transform, respecting the richness of the world's knowledge commons. I see education for global citizenship and sustainable development - encompassed in SDG target 4.7 for which MGIEP is such a strong advocate and ally - as requiring this shift in mindset.

As the first and only Category 1 institute of UNESCO located in the Asia-Pacific region, UNESCO MGIEP over the last six years has established itself as a centre of excellence for research and practice for transformative learning. I am pleased that the Institute has taken on the challenge to strengthen the 'science-policy nexus' in the field of education and am confident that the findings of this Assessment will provide rich evidence to inform transformative policies around a new social contract that serves all learners and responds to the interconnected challenges that we face today as a human family.

This Summary for Decision Makers (SDM) encapsulates key messages, findings and recommendations from The International Science[1] and Evidence-based Education Assessment (ISEE Assessment). Over 300 experts from over 45 countries working across a wide range of disciplines participated in the ISEE Assessment. It was reviewed by over 40 scholars and took just over two years to compile. The ISEE Assessment began with a design workshop hosted by the Chief Scientist of Quebec in September 2019 in Montreal. In spite of the COVID-19 pandemic, the authors were able to produce an over 1000-page, 25-chapter report covering education and its goals, the role of context in education, the learning experience, and the role of data and evidence in policy decision making. The key findings, policy recommendations, and take-home messages discussed in the SDM are just the tip of the iceberg. We recommend reading this SDM in conjunction with the full report to gain a deeper understanding of the education system and how we might develop blueprints to design and implement an education for a peaceful and sustainable planet.

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[1] We define science as the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence (The Science Council: https://sciencecouncil.org/about-science/our-definition-of-science).

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KEY TAKE HOME MESSAGES

We introduce the SDM with key take home messages that have emerged from the 25 chapters of the ISEE Assessment.

1   **Every learner learns differently,** and is influenced by a complex combination of internal factors (biological including neurobiological) and context (political, social, cultural, institutional, environmental, technological, etc.). Therefore, receiving a personalized learning experience is an entitlement and a human right for every learner.

2   **A whole-brain learner-centric** approach towards learning strengthens the interconnectedness of cognition and the social-emotional domains, which is essential for human flourishing.

3   **Context heavily influences** the design and implementation of an education for flourishing but over time, education for flourishing will also influence context, leading to an upward spiral towards sustainable and peaceful societies across the world.

4   **Learner agency** should be promoted by shifting from passive to active learning, where each learner actively engages in and experiments with information and the environment and the relationship between teacher and student is bi-directional.

5   **Potentiality instead of meritocracy** should be used to evaluate the success of learners. Potentiality is measured by an individual's own rate of learning based on a personalized learning trajectory that uses dynamic and formative learner assessments.

6   **Investment in education** is needed but must be directed to a whole-brain learner-centric system designed and implemented to be equitable and inclusive.

7   **Multidisciplinary** dialogue, research and collaboration is needed to ensure different perspectives, understanding and context to guide education and learning.
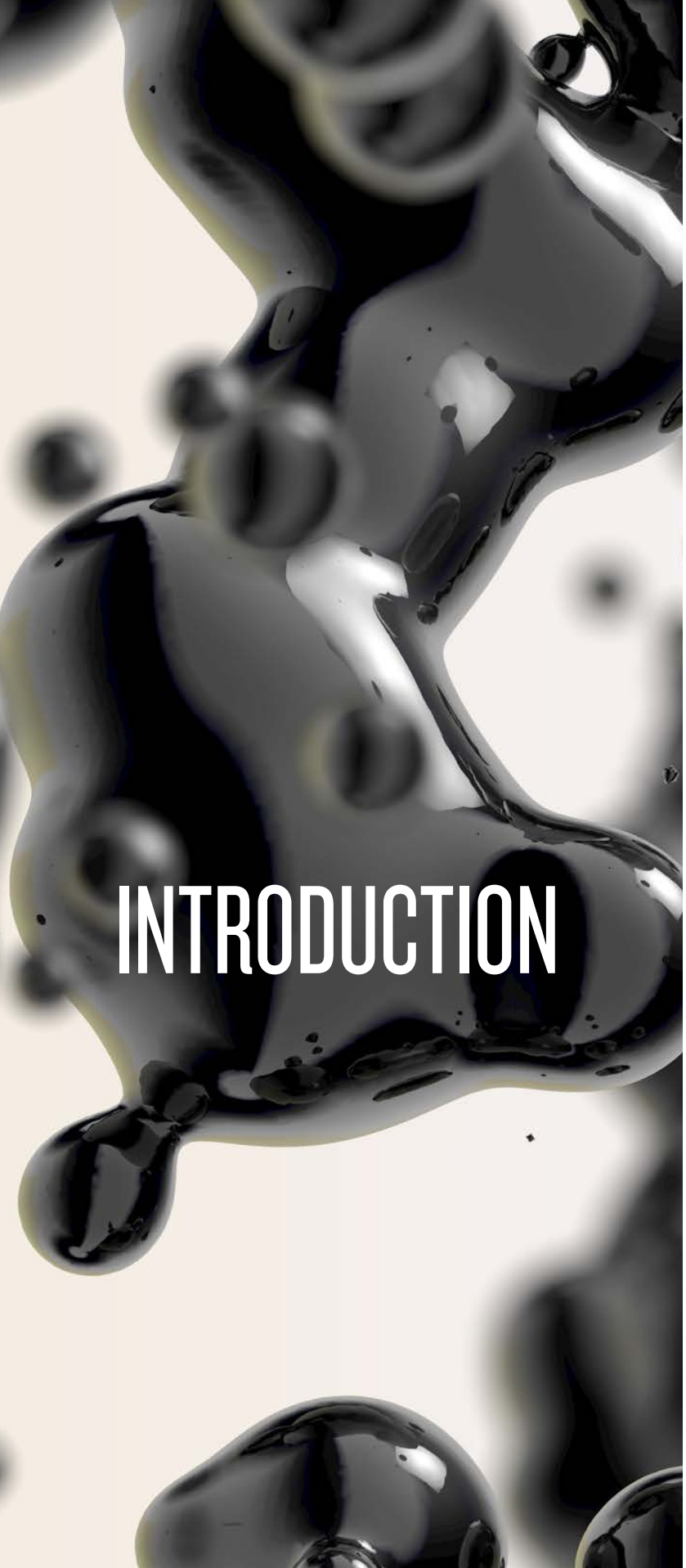
INTRODUCTION

Education today faces different challenges from those of 300 years ago, when systems of mass schooling developed in tandem with the emergence of modern nation-states **(WG2-ch1).**

First, our ecosystems are under threat. Climate change and unprecedented biodiversity loss have led to changes in our food and life support systems (Intergovernmental Panel on Climate Change; Intergovernmental Science-Policy Platform on Biodiversity **(WG2-ch2)**. Second, our social systems are breaking down. Inequality is growing at an alarming rate **(WG1-ch1, ch2; WG2-ch3)**, and our progress in reducing poverty is fragile. The COVID-19 pandemic has seen a massive global increase in poverty **(WG2-ch3, ch6)**. And while there are fewer global armed conflicts, there are more localized violent conflicts (Institute of Economics and Peace). Third, fragile economic systems, job uncertainty, and ever-increasing competition and polarization are leading to increasing levels of stress, anxiety, depression, and suicide **(WG1-ch1; WG2-ch2).**

These are happening due to our own actions driven by mindsets heavily influenced by our present education systems. These unsustainable trends may have catastrophic consequences for humanity if we do not act now. Our future depends on how we, as a global society, build our education systems to ensure our continued human advancement and flourishing, as well as the flourishing of the planet as a living organism **(WG1-ch1,2,3; WG2-ch2).**

A massive shift in mindset is needed in which education must play a key role. We must unlearn many of our current practices; practices that have been shaped over three centuries by education systems designed for an industrial age **(WG2-ch2)**. We need to adopt education practices that prepare us for a future with the ultimate objective to make this world peaceful and sustainable.

Education matters for people at all stages of life. But if education is to address the social, economic, and environmental challenges we face, we must clearly identify its purpose in improving the human condition holistically, not just as a tool to promote economic growth **(WG2-ch2)**.

UNESCO commissioned its first global vision study for education, the Faure report, in 1972. Titled "Learning to Be", it recognized the importance of education for humanity and situated lifelong learning at the heart of society. It positioned every individual as an agent of change, a promoter of democracy, a citizen of the world, and the author of their own fulfillment.

In 1996, UNESCO's Delors report, titled "Learning: The Treasure Within", provided a vision for education for the 21st century **(WG1-ch1; WG2-ch1; WG3-ch1)**. It expanded the Faure report's pillars of learning from "learning to be" to include "learning to know", "learning to do", and "learning to live together" **(WG1-ch1)**. These four pillars offered an alternative to the World Bank's utilitarian driven "Priorities and Strategies for Education" report of 1995 and the OECD's "Education and the Economy in a Changing Society" study of 1989. UNESCO's latest visionary exercise, "The Futures of Education", provides guidance on the future of education. It was delivered to the UNESCO 40th General Conference in November 2021. The International Science and Evidence based Education (ISEE) Assessment, initiated by the UNESCO Category 1 Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP), supports The Futures of Education initiative by providing a comprehensive assessment of relevant literature. It outlines the driving forces behind the development of education systems around the world and evaluates their success, and identifies gaps in knowledge and future needs. It hopes to provide the gene pool for developing blueprints for designing and implementing an education for the future; an education for human flourishing.

MAIN OBJECTIVES OF THE ISEE ASSESSMENT

The ISEE Assessment is a first of its kind for the education sector, attempting to identify a way forward for education and learning according to an evidence based multidisciplinary assessment of the state of education across the globe.

It contributes to UNESCO's Futures of Education by:
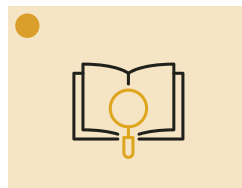
bringing together the latest research to understand the what, where, how, and when of learning, what educational interventions and reforms work (or otherwise), and identifying knowledge gaps and future research avenues;

bringing together experts from a range of disciplines, including educationalists, psychologists, neuroscientists, cognitive scientists, economists, historians, and philosophers;

suggesting relevant policy recommendations and strengthening the science–policy nexus.

It differs from international large-scale student assessments such as the Programme for International Student Assessment (PISA) **(WG2-ch9)**, which provides internationally comparable adolescent student outcomes every three years and focuses on literacy and numeracy. The ISEE Assessment actually evaluates whether PISA and similar measures achieve their aims or whether new measures are needed.
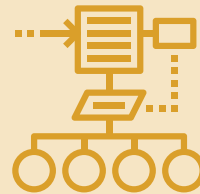
This Summary for Decision Makers (SDM) outlines five key questions (see Figure 1) emerging from the ISEE Assessment. The full report comprises 25 chapters in four volumes covering:
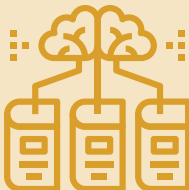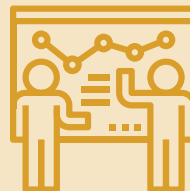
1

education and human flourishing

2

influence of context

3

the learning experience

4

data and evidence

THE ISEE ASSESSMENT CONCEPTUAL FRAMEWORK

The ISEE Assessment's conceptual framework **(Figure 2)** captures the key inter-linked elements that guide the ISEE Assessment. Developing a conceptual framework is an essential first step in what is a dynamic activity and the report draws upon the framework introduced by Duraiappah et al. 2021 "The International Science and Evidence based Education Assessment". The conceptual framework provides an educational and learning lens to achieve the 17 Sustainable Development Goals (SDGs) **(WG2-ch4)** that aim for a peaceful and sustainable world. It places human flourishing at the centre of education and learning **(Box 1)**. Various conceptions and definitions of flourishing relevant to education, as well as their scientific evidence, are assessed **(WG1-ch2)**. A common definition of flourishing related to education and based on the relevant literature is provided as the benchmark for evaluation **(see Key Definitions)**.

Key Question 1 asks: Has education evolved over the past 50 years for the betterment of society? We map trends in education targets over past 50 years in tandem with elements of education for human flourishing, we discuss how context also called mediating factors in this assessment (political, social, cultural, institutional, environmental, technological) influence interpretation of the diverse goals of education, and the capacity of education systems to meet these goals **(Box 2)** impact education policies and practices **(Box 3)** but also human flourishing directly **(Box 1)**. We acknowledge that these contextual factors may directly impact flourishing and that flourishing is not only influenced by education and learning. We focus on better understanding how context influences—and is influenced by—education systems **(the link between Boxes 2 and 3)**. For example, the ISEE Assessment reports on how economic policies, cultural and social beliefs and standards, labor market pressures, climate change and politics influence curriculum development, student assessment, and competition for credentials **(WG2-ch8, ch9; WG3-ch4)**. This is the foundation of Key Question 2: How has context shaped education policies and practices over the past 50 years?

Key Question 3 asks: How has context, together with education policies and practices, influenced "What we learn", "How we learn" **(WG3)**, "When we learn", and "Where we learn" **(WG2; WG3-ch7)**? This is captured by the link between Boxes 3 and 4. Here we review and evaluate the latest research to guide our re-imagining of the "what", "how", "where", and "when" of learning and education for human flourishing **(linking Boxes 4 and 1)**, taking into account contextual factors such as culture, religion, and socio-economic status. This is followed by our Key Question 4: How can education be reimagined to maximize human flourishing? In this question we draw from the experiences of the past plus the latest research findings from the sciences of learning to unpack the multifarious aspects of education and its goals to encourage an education for human flourishing that accommodates the needs of individual learners but also contributes to societal aspirations for peace and sustainability.

Finally, Key Question 5 asks: Which gaps should be addressed in future research?

The answers to Key Questions 1 to 5 provide policy recommendations at the international, national, and subnational level, for school professionals and other stakeholders, including learners.

01 KEY QUESTION
Has education evolved over the past 50 years for the betterment of society?

02 KEY QUESTION
How has context shaped educational policies and practices over the past 50 years?

03 KEY QUESTION
How has context, together with education policies and practices, influenced "what we learn", "how we learn", "when we learn", and "where we learn"?

04 KEY QUESTION
How can education be reimagined to maximize human flourishing?

05 KEY QUESTION
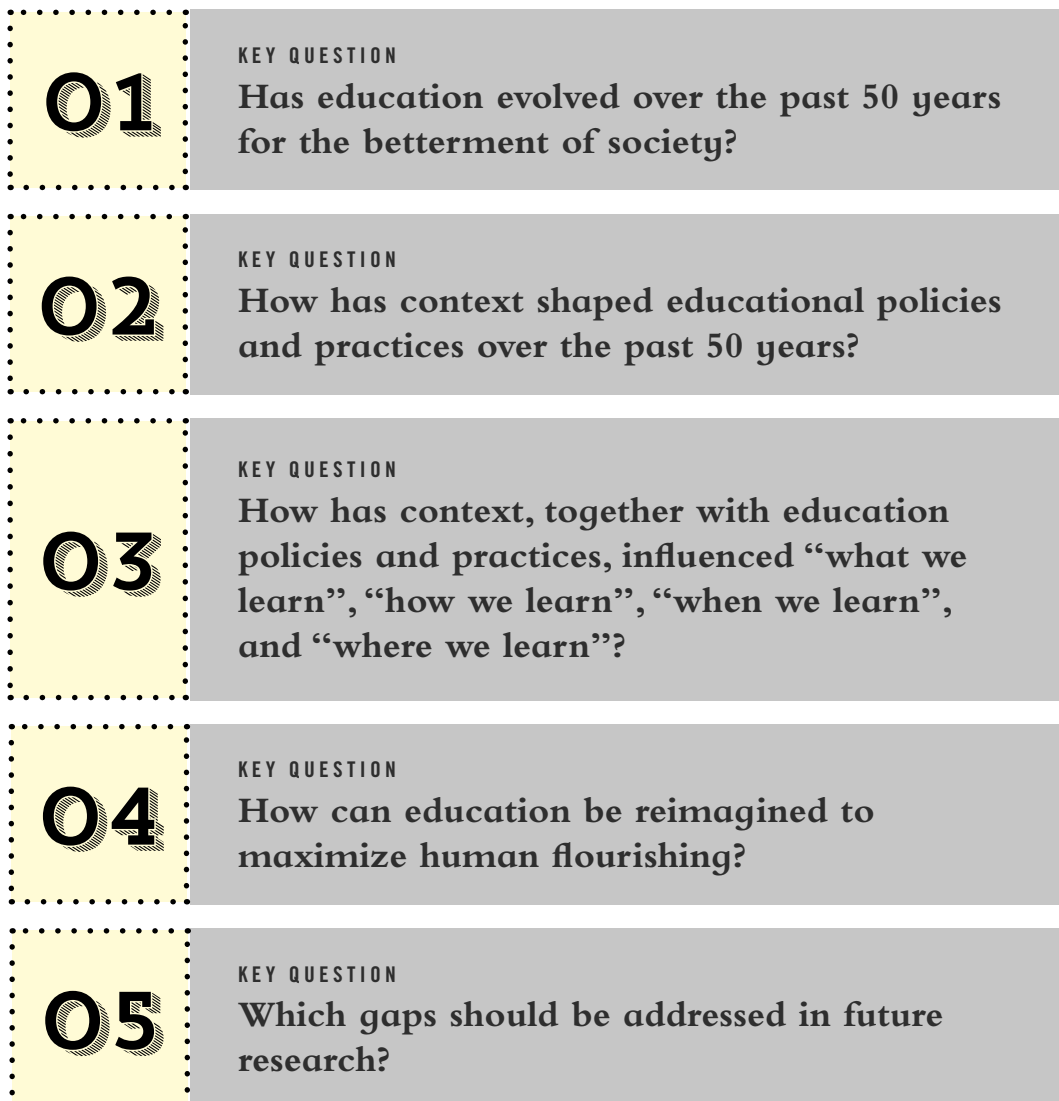**Which gaps should be addressed in future research?**

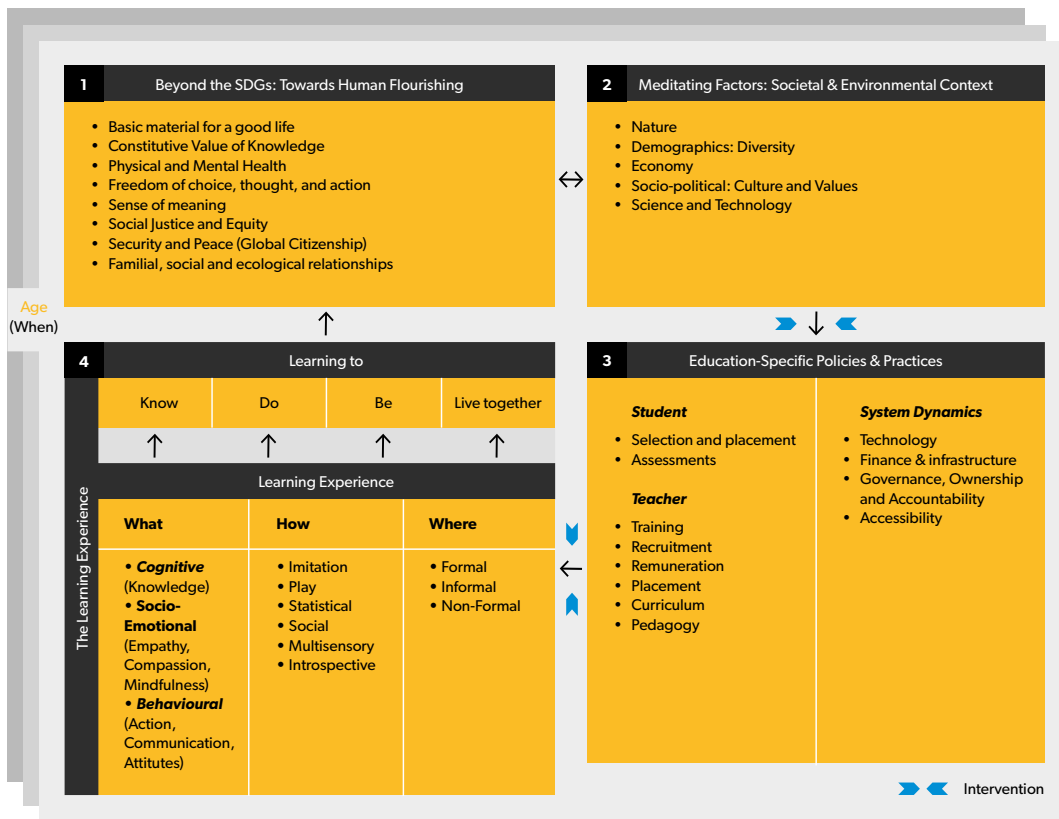*Figure 1:* Key Questions Guiding the SDM

Figure 2: The ISEE Assessment Conceptual Framework of Life-Long Learning, Source: Adapted from Duraiappah et al. (2021, Figure 1, p. 2)

Target Group

The SDM is aimed at decision makers, such as policy makers at the international level (e.g., UNESCO, OECD, World Bank), national level, and subnational level (e.g., states or provinces). The SDM is also aimed at school boards, school leadership, teachers, parents, the academic community, and learners in general. The recommendations are inter–linked, forming a suite of suggestions to be implemented as a package.

Methodology and Approaches

Given its scope, the ISEE Assessment necessarily draws on a wide range of disciplines in education. The evidence includes quantitative and qualitative data. A working group on "Data & Evidence" addresses different definitions and approaches within the broad education community and provides guidance on the type of data and evidence needed for evidence-based education strategies and future assessments.

Using both quantitative and qualitative data allows for a synthesis of trends and drivers of change, enabling the policy recommendations on education to contribute to peaceful and sustainable societies. It is important to note that the expert judgments in the ISEE Assessment are more than a literature review. They draw on the following sources (i.e., evidence):
(i) peer-reviewed literature;
(ii) primary and secondary sources of policies and practice for selected countries (national, local, and school levels), and debates on relevant issues;
(iii) available survey statistics on school participation, achievement, and other relevant indicators. Our critical analysis of evidence is combined with assessment by over 300 experts of research in the field of education, psychology, conflict, international development, neuroscience, sciences of learning, history education, and peace and conflict studies.

Recognizing that all research is to some extent subjective, and methods are inherently "messy", we contend that "subjectivity" is offset by an interdisciplinary approach,

highly qualified authors, and an independent peer-review system, and the clustered education framework we put forward. The findings are drawn from the body of literature assessed, and are as comprehensive as possible, although inevitably not complete. We aim to set an initial benchmark for future assessment studies.

Key Definitions

To evaluate if education has contributed to the betterment of society, we use **flourishing** as the key benchmark. We first provide a definition of **human flourishing**, which is informed by various academic disciplines but favors no particular theory. We define flourishing as a hybrid concept: naturalistic, culture-dependent, and agent-relative. It is both objective and subjective. Key elements form the basis of flourishing, but humans also have their own views, preferences, and desires about how to develop and enact their potential **(WG1- ch2)**. Further, flourishing involves community—it is an interpersonal pursuit or project **(WG1- ch3)**.

Human flourishing is both the optimal continuing development of human beings' potential and living well as a human being, which means being engaged in relationships and activities that are meaningful, that is, aligned with both their own values and humanistic values, in a way that is satisfying to them. Flourishing is conditional on the contribution of individuals and requires an enabling environment **(WG1- ch2)**.

We define education, learning, teaching and learner evaluation as follows:

Education: *The concept of education is constituted by the acts of human relations that in turn give rise to how teaching, learning, and learner evaluation are organized. It is based on / grounded in human relations with themselves, with fellow humans, non-humans, and the environment* **(WG1- ch1, ch4)**.
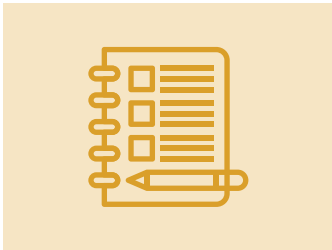
Learning: *Learning happens when students' potentials are evoked to come to understanding in agential ways of being and acting. In learning, students act as human agents, intent on coming to make sense of the knowledge they are taught or read 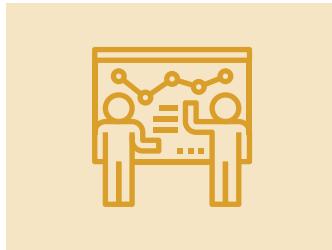and/or the experiences they gain. That is, their learning becomes significant on the basis of their potentials being evoked to see the point. Now when their potentials are evoked, they exercise their freedoms to think for themselves and to make sense of the world around them. Learning is inherently social, emotional, relational, and affective* **(WG1-ch2; WG2-ch8; WG3-ch4)**.

Teaching: *Teaching happens when the teacher provokes students to come to understanding. Teaching would not be teaching if students were not aroused to see the point* **(WG1-ch2)**. *Teaching is an activity in which an intention to propel changes in knowledge, understanding, behavior, attitude, and/or opinions in a student is exercised in a nurturing way through diverse forms of human expression, such as speech, bodily demonstration, art, and science* **(WG1- ch2, ch4; WG2-ch10)**.
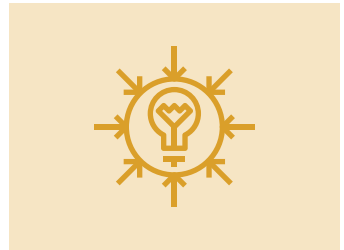
Learner Evaluation: *Learner evaluation in the context of learning and education is seen as a constant activity occurring during formal or informal teaching as a teacher evaluates student understanding and reflects on their work, and as students reflect on and regulate their own learning. Furthermore, student learning assessment is also a formal practice that occurs at the school and policy-making level* **(WG1- ch4; WG3- ch5)**.

HAS EDUCATION EVOLVED OVER THE PAST 50
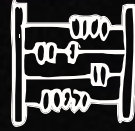
Has education evolved over the past 50 years for the betterment of society?

PAST 30 YEARS FOR THE BETTERMENT OF SOCIETY?
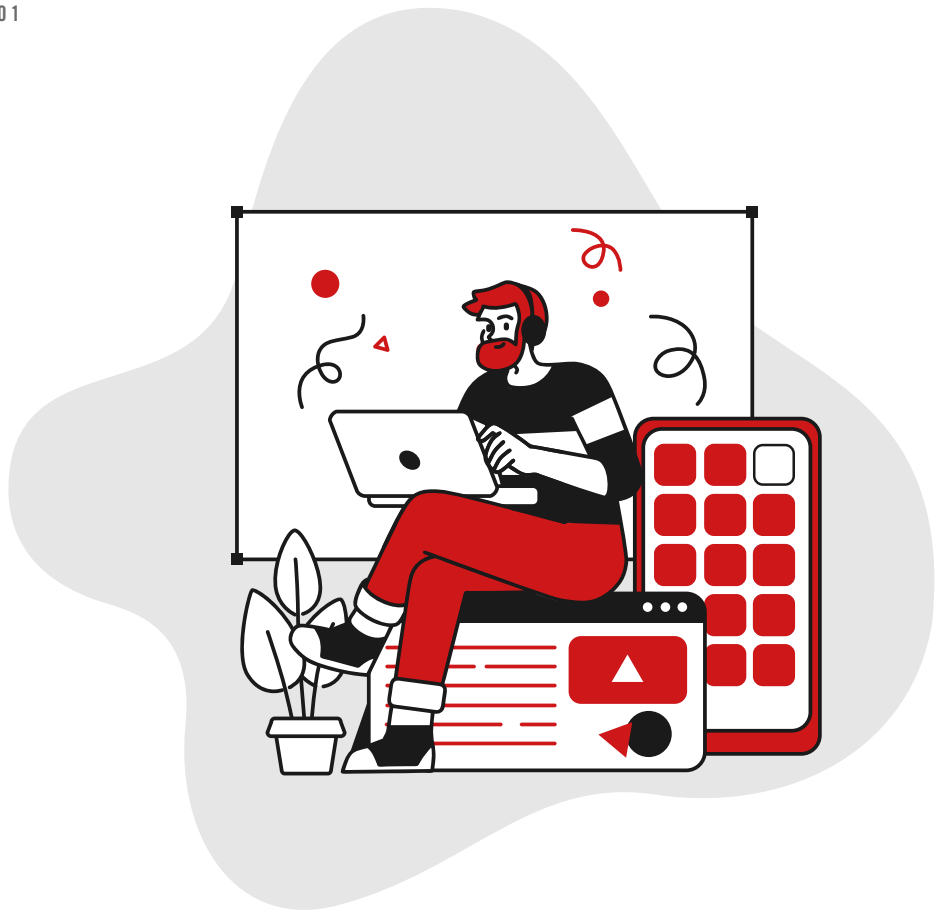
KEY FINDING

1.1

Despite advancements in some segments across the world, education policies have unintentionally exacerbated inequality, establishing new forms of elitism and a mindset focused on individualism.
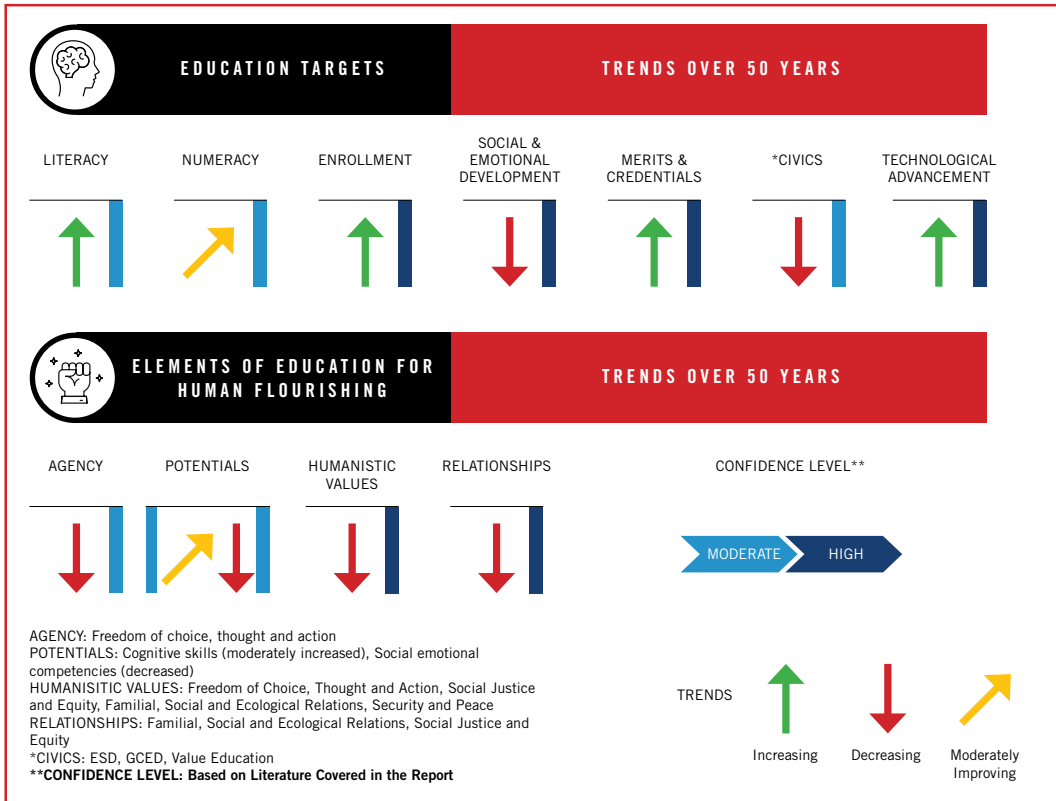
Figure 1.1. Trends Over Fifty Years of Education Targets and Elements of Education for Human Flourishing

Over the past 50 years education has spurred tremendous technological and scientific advancements, lifted millions out of poverty, and improved the lives of many. However, it has also exacerbated social exclusion and inequality, establishing new forms of elitism and a mindset focused on individualism.

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Since the 1980s, policies in both developed and developing countries have emphasized economic growth, privatization, and markets, leading to a wave of education reforms stressing education as a driver of economic outcomes **(figure 1.1)**. That is, the quest for the "knowledge-based economy" has pushed aside the social, societal, and environmental benefits of education **(WG1-ch1; WG2- ch3)**.

As a result, student agency, humanistic values, potentials and relationships have diminished **(WG2-ch2, ch3, ch4, ch5; WG3- ch7, ch6)**, and disconnected education from its core purpose-human flourishing. While many have better living conditions because of education, they do not necessarily have better lives.

KEY FINDING

1.2

The present focus on human capital (literacy and numeracy skills) is not optimal for human flourishing.

Education policy and practice focusing on academic performance rather than balancing it with social and emotional competencies, has led to a decline in human and societal flourishing.

Education policy and practice focus on academic performance rather than balancing it with social and emotional competencies, leading to a decline in human and societal flourishing **(WG2- ch9; WG3- ch4, ch5).**

Most contemporary education systems focus on building qualities and capacities in children for their future professional, personal, and civic lives. However, most emphasis is placed on the first, neglecting the remaining two **(WG2- ch3; WG3- ch4).**

What gets measured gets managed. Human capital is the key education indicator used by most policy makers to gauge the success of education investments and interventions. Human capital is computed using national literacy, numeracy, and enrolment levels. Hence, learning evaluations such as the PISA, Trends in International Mathematics and Science Study (TIMSS), and Progress in International Reading Literacy Study (PIRLS) become key priorities **(WG2- ch9).**

Education policy and practice focus on academic performance rather than balancing it with social and emotional competencies, leading to a decline in human and societal flourishing (WG2- ch9; WG3-ch4, ch5).

The ISEE Assessment highlights that learning is inherently social, emotional, relational, and affective **(WG3-ch4)**. As part of formal education, integrated social and emotional learning (SEL) interventions are positively related to, for example, attendance, behavior, and course performance (ABCs), and to grade point average (GPA) **(see Figure 1.2)**, with significant results identified across all education stages **(WG3-ch4)**. **Figure 1.2** highlights the need for continuous investment in SEL throughout and beyond the schooling years to ensure the positive impacts of SEL **(WG3- ch3, ch4)**.

Refining and assessing students' SEL skills supports not only their personal lives, but also their interactions with others and with nature **(WG2-ch8; WG3-ch7)**. Children's education outcomes depend on multiple, interacting cognitive systems that support foundational academic skills directly and indirectly. Core cognitive components include executive function, memory, and language. Literacy and numeracy in conjunction with social and emotional competencies are keys that unlock all other learning opportunities throughout the entire education journey **(WG3-ch5, ch3, ch6)**.

KEY FINDING

I.3

Meritocracy has backfired, creating a new form of educational,

social, and economic exclusion in the guise of credentialism and exacerbating inequitable flourishing outcomes.

> Meritocracy is touted as a major social equalizer in a neo-liberal market-oriented education system, but has had the opposite effect, creating a new form of educational, social, and economic exclusion in the guise of credentialism and exacerbating inequitable flourishing outcomes (WG2-ch1, ch3, ch4, ch9; WG3- ch3).

Meritocracy is touted as a major social equalizer in a neo-liberal market–oriented education system, but has had the opposite effect, creating a new form of educational, social, and economic exclusion in the guise of credentialism and exacerbating inequitable flourishing outcomes **(WG2-ch1, ch3, ch4, ch9; WG3- ch3).**

Meritocracy has become one of the most influential educational and social ideals. Ability and effort should decide the life chances of each person—not "extraneous" factors such as social origin, gender, ethnicity, or sexual orientation **(WG2- ch3)**. Meritocracy has not delivered its promise **(WG2- ch3)**. Rather, it entrenches a new form of inequality, "hereditary meritocracy", in which the social, economic, and environmental conditions at the beginning of an individual's life significantly influence the outcomes measured by meritocracy. Children of parents from society's top tier have a starting advantage over children from "economically" poor parents **(see Figure 1.3)**.

HOW DOES SEL CORRELATE WITH THE ABC'S?
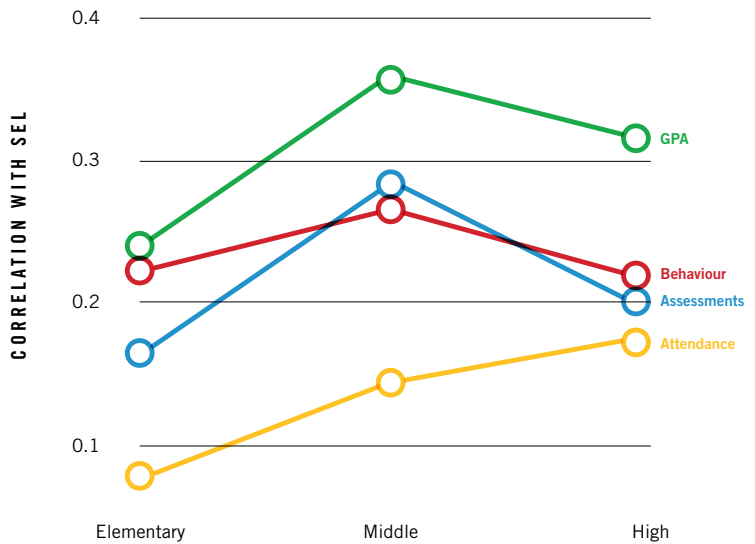
Figure 1.2. Associations of SEL Competencies with Attendance, Behavior, Course Performance, and GPA in the US (2019)
Source: Adapted from https://www.edsurge.com/news/2019-01-28-the-abcs-of-sel-or-the-impact-of-social-emotional-learning

STUDENT BODY SKEW TO WEALTH BY COLLEGE SELECTIVITY
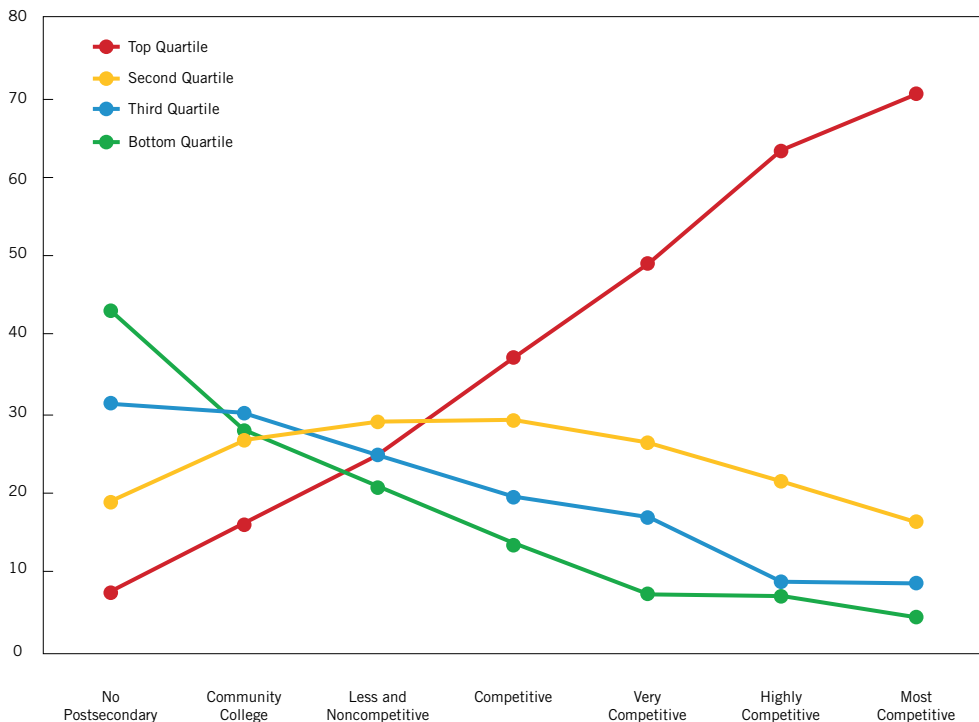
Figure 1.3. US Student Body Skew to Wealth by College Selectivity
Source: Adapted from Anthony P. Carnevale and Jeff Strohl (2010) - ' How Increasing College Access is Increasing Inequality, and What to Do about it. Rewarding Strivers. Helping Low Income Students Succeed in College, ed. Richard D. Kahlenberg.

Although much of this analysis comes from the US, similar trends are observed across OECD countries **(WG2- ch1, ch3)**. We were not able to obtain data for the many low income countries (LIC) and lower middle income countries (LMIC), but postulate that there are similar trends in these countries as they privatize their education systems.

The educational achievement of children from lower socio-economic backgrounds is relatively poor across educational stages, a trend that exists globally **(WG2- ch4)**. Earlier studies explain poor educational achievement in terms of individual "deficit" (e.g., poor language skills, poor "school readiness"), whereas the current emphasis is on structural mechanisms, whereby mainstream schools operate via the dominant culture (e.g., language of instruction, school curriculum, interpersonal interaction patterns, worldviews), which disadvantages children **(WG2- ch4)**.
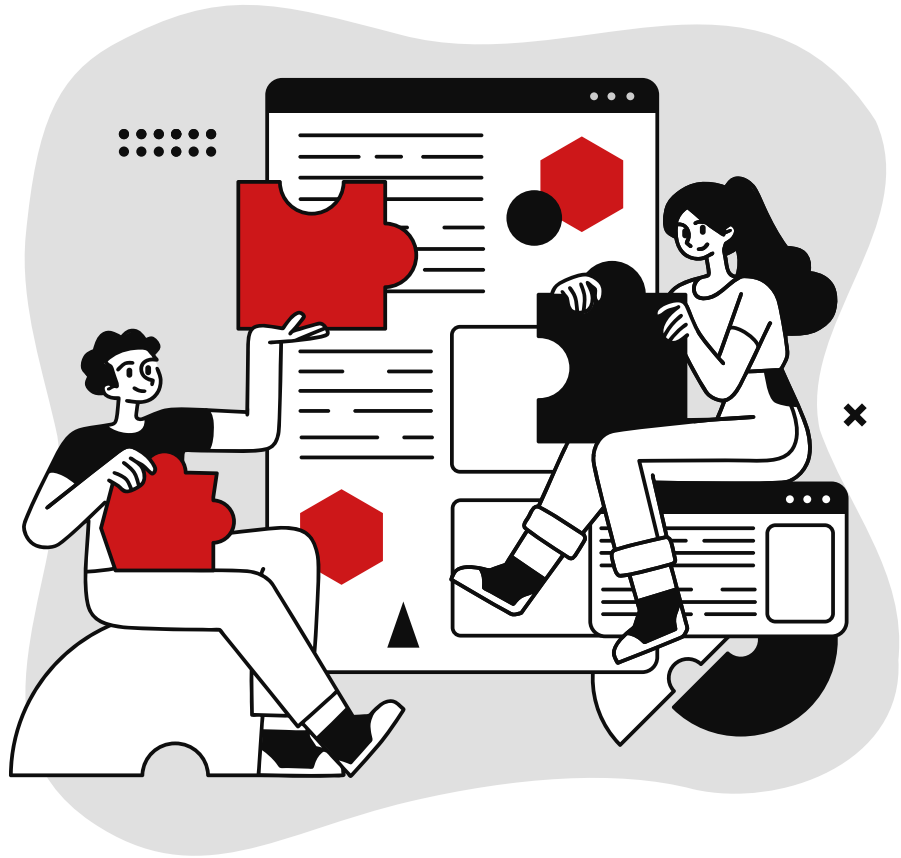
1.4

The present learner assessments focusing on standardized, time-bound,

'one-size-fits-all' summative learner examinations are not optimal for learning and flourishing.

Education experts consider standardized, time-bound, "one-size-fits-all" approaches to evaluating learning to be flawed because first, they fail to really evaluate learning progress, they entrench the negative aspects of meritocracy, decrease students' physical and mental health, and stratify society into "haves" and "have nots" **(WG2- ch9).**

Learner assessment is necessary in education, and key to the activity of learning itself. However, assessment practices and techniques

> **Education experts consider standardized, time-bound, "one-size-fits-all" approaches to evaluating learning to be flawed because first, they fail to really evaluate learning progress, they entrench the negative aspects of meritocracy, decrease students' physical and mental health, and stratify society into "haves" and "have nots" (WG2-ch9).**

are not value-neutral, context-independent tools for maximizing "effectiveness" or "efficiency" as is assumed in public policy debates.

Contemporary education systems focus on identifying and evaluating skills related to reading, mathematics, and science. "Summative assessment" (assessment OF absolute learning outcomes) is the most common approach. Its basic function is to rank and score learners, thus legitimizing meritocracy in selecting individuals for further study or employment opportunities. Summative assessment mostly uses standardized tests and high stakes examinations, leading to competitive comparisons. These assessments overlook children's different access to education resources, including quality of teaching, access to facilities, and inequalities such as gender, religion, race, and linguistic elements. Hence the "learning divide" is further entrenched **(WG2-ch9)**. Exam failure and an aggressive push by parents and teachers for high performance have led to widespread stress, even suicide. Overly competitive (summative) assessment negatively impacts children's physical and psychological health, household finances (parents compete in the race for credentials), socio-economic inequality, and even decisions over fertility. Yet, there is little evidence of a correlation between

performance in standardized tests and actual learning **(WG2-ch9; WG3-ch5)**.

"Formative assessment" (assessment FOR learning) has developed recently to foster learning. Formative assessment programs seek to allow teachers to appraise exactly this – how well the student is performing in a path to reach intended goals. It stresses how assessment can contribute to efforts by teachers and students to seek, reflect upon, and respond to information from dialogue, demonstration, and observation to enhance ongoing learning **(WG2-ch9)**. At an individual level, formative assessment tools are adaptive to identify both the differences in students' learning processes and the necessary instructions required to bridge any gap in such processes **(WG2-ch9)**. Dynamic testing (feedback while the test is being conducted) has also been identified as a better means for assessing students' strengths, weaknesses and learning potential in different cognitive domains when compared to summative static testing. This makes dynamic testing and formative assessment (an assessment method that embodies the idea of continuous as well as dynamic testing) one of the testing methods that promotes learning and not just test learning **(WG2-ch9)**.

KEY FINDING

1.5

Educational expenditure requires closer scrutiny of the 'what', 'how', 'when', 'where' and 'for whom'

these investments are made to maximize returns on education for human flourishing and ensure equitable outcomes for all.

While government expenditure has grown, more is needed, but educational expenditure requires closer scrutiny of what, where, and when most investments are made to maximize returns on educational outcomes and contribute to the betterment of society. Equity-based benchmarks must be a necessary condition for all educational investments **(WG2- ch3).**

While government expenditure has grown, more is needed, but educational expenditure requires closer scrutiny of what, where, and when most investments are made to maximize returns on educational outcomes and contribute to the betterment of society. Equity-based benchmarks must be a necessary condition for all educational investments (WG2-CH3).

To achieve educational goals by 2030, the Education 2030 Framework for Action **(WG2- ch3)** establishes two benchmarks for public financing of education: i) governments should allocate at least 4-6% of GDP and/ or ii) allocate at least 15-20% of public expenditure to education. **Figure 1.4a** shows the global average public education expenditure and the average global share of total public expenditure on education. Expenditures are on track for many countries but a significant number of countries **(those in the bottom left quadrant in Figure 1.4b)** are falling short of the minimum standards **(WG2- ch3)**. Moreover,the poorer the country, the larger the burden on households **(Figure 1.4c) (WG2- ch3)**. However, these

educational investments are centered on supporting an educational system that is exacerbating the present crisis in education rather than promoting an education for human flourishing.

The COVID-19 pandemic is expected to make household expenditure for education lower if other household expenditure items become more costly and are prioritized over education. A deterioration of education is expected if governments do not increase public funding for education **(WG2- ch3)**. **Figures 1.4d** and **1.4e** reveal that the pandemic is likely to exacerbate the education financing gap between high- and low-income countries by up to 30%.

GLOBAL AVERAGE PUBLIC EXPENDITURE ON GDP AND EDUCATION
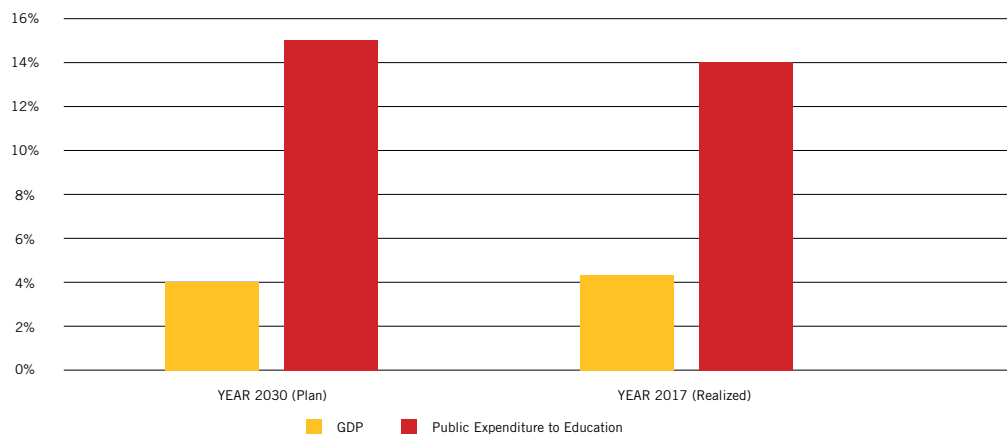
Figure 1.4a. Global Average Public Expenditure of GDP on Education
Source: Adapted from UNESCO (2015b)² (WG2- ch3)

² https://unesdoc.unesco.org/ark:/48223/pf0000232205

PUBLIC EDUCATION EXPENDITURE AS A SHARE OF GDP AND OF TOTAL PUBLIC EXPENDITURE, COUNTRIES BELOW BOTH BENCHMARKS, 2017 OR MOST RECENT YEAR

Source: UIS database

Figure 1.4b. Total Public Expenditure on Education as Share of GDP and as Share of Total Government Spending
Source: Adapted from UNESCO (2019b, Figure 15, p. 11)[3] (WG2- ch3)

TOTAL SPENDING ON EDUCATION, BY COUNTRY INCOME GROUP AND FINANCING SOURCE, 2014

DISTRIBUTION OF TOTAL SPENDING ON EDUCATION, BY COUNTRY INCOME GROUP AND FINANCING SOURCE, 2014
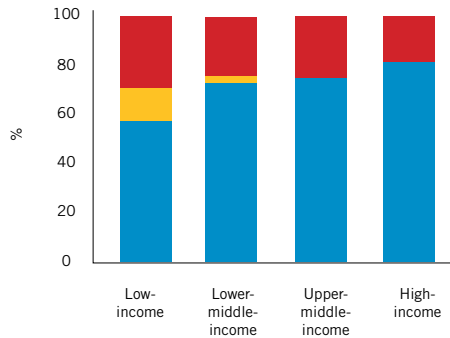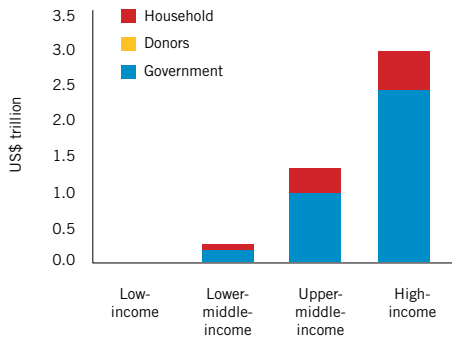
Source: GEM Report team analysis based on UIS (government and household) and OECD CRS (donor) databases

Figure 1.4c. Total Spending on Education by Country Income Groups and Financing Source
Source: Adapted from UNESCO (2019b, Figure 14, p. 11)[4] (WG2-CH3)

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[3] https://unesdoc.unesco.org/ark:/48223/pf0000369009
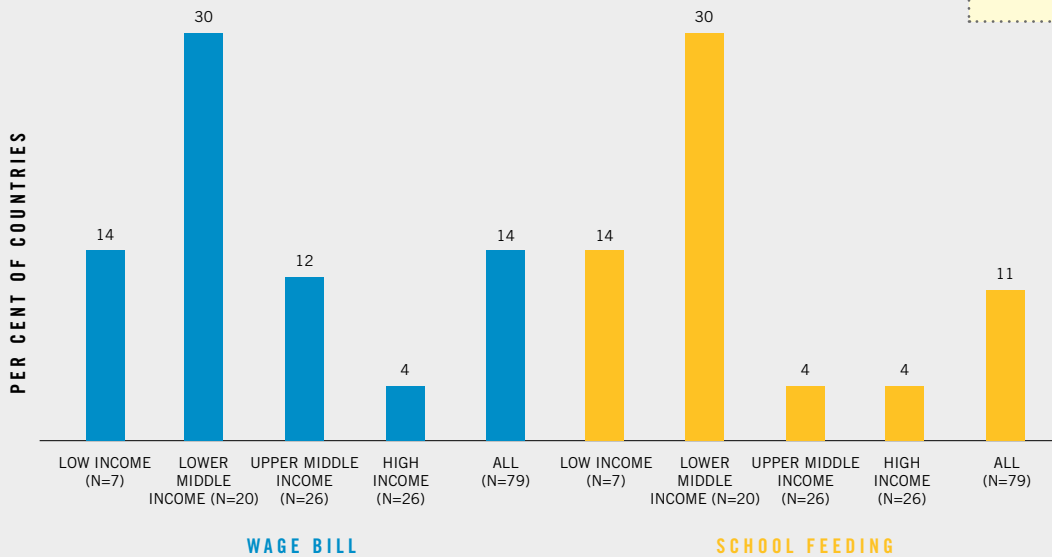
[4] https://unesdoc.unesco.org/ark:/48223/pf0000369009

PER CENT OF COUNTRIES

WAGE BILL   SCHOOL FEEDING

Notes: This figure presents the share of countries that indicated a reduced government budget in 2020 or 2021 either on wage bills (either without teachers or including teachers) or school feeding in relation to (n) the number of countries that have provided a valid response on questions relating to fiscal budget declines. Caution is advised in generalizing the results represented in the figure as the countries that responded to this question cover less than 50 per cent of the total 4–17 year-old population. More information on the coverage of each income group can be found in Annex 1.

Figure 1.4d. Decline in Government Education Budget for 2020–21 due to COVID-19, by Income Group and Component.
Sorce: Adopted from UNESCO et al. (2020) What have we learnt? Overview of findings from a survey of ministries of education on national responses to COVID-19[5]
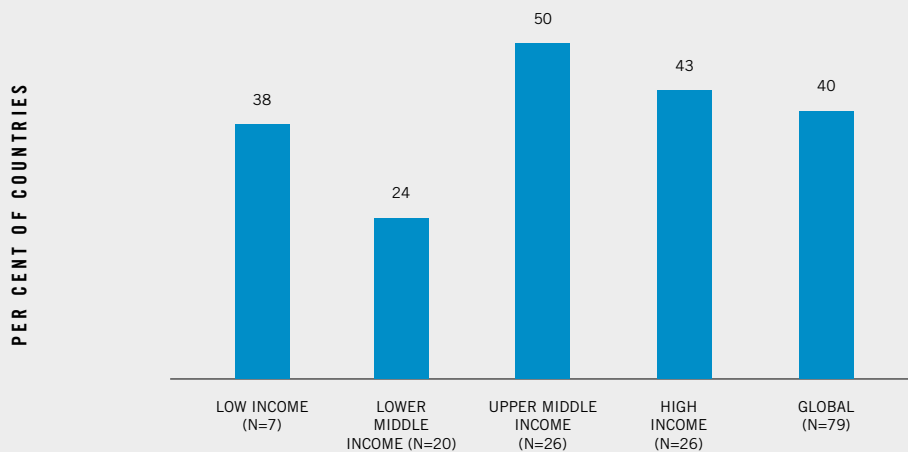
PER CENT OF COUNTRIES

Notes: This figure presents the share of countries that indicated a reduced government budget in 2020 or 2021 either on conditional cash transfers or scholarships in relation to (n) the number of countries that have provided a valid response on questions relating to fiscal budget increase. Caution is advised in generalizing the results represented in the figure as the countries that responded to this question cover less than 50 per cent of the total 4–17 year-old population. More information on the coverage of each income group can be found in Annex 1.

Figure 1.4e. Government Budget to Increase Support for Households for 2020–21, by Income Group
Source: Adapted from UNESCO et al. (2020) What have we learnt? Overview of findings from a survey of ministries of education on national responses to COVID-19[6]

[5] https://uis.unesco.org/sites/default/files/documents/national-education-responses-to-covid-19-web-final_en_0.pdf

[6] http://uis.unesco.org/sites/default/files/documents/national-education-responses-to-covid-19-web-final_en_0.pdf

KEY FINDING

1.6

<u>Inclusive education policies have been established</u>

but have not resulted in equal opportunities for marginalized groups based on gender, ethnicity/race, sexual orientation, disability and neurodiversity

While there have been improvements, inequalities in education for minority groups based on gender, ethnicity/race, sexual orientation, (dis)ability, and neurodiversity persist. When meritocracy is the benchmark for success, students from minority groups are marginalized.

Most countries officially aim for equal education opportunities regardless of gender, race/ethnicity, linguistic heritage, religion, social class, and (dis)ability. Sexuality and neurodiversity are more recent additions to the diversity discussion in some countries. Despite this, the ISEE Assessment finds significant inequalities in education, and education opportunities remain for minority students **(WG2-ch4).**

While there have been improvements, inequalities in education for minority groups based on gender, ethnicity/race, sexual orientation, (dis)ability, and neurodiversity persist. When meritocracy is the benchmark for success, students from minority groups are marginalized.

Gender: In primary education, gender parity in enrolment has been achieved in two thirds of the world's countries. However, over 30% of primary school-age girls are still without access to school **(WG2-ch4)**. In secondary education, worldwide, almost one in four girls between 15 and 19 years of age are neither employed nor in education or training (NEET), compared to one in 10 boys of the same age **(Figure 1.5) (WG2-ch4)**.
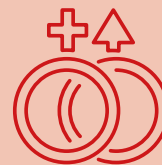
LGBTQ+ students: Acceptance of sexual and gender diversity has grown, but education can increase LGBTQ+ acceptance and inclusion. Hostility, bullying, segregation, exclusion, and sexual violence towards LGBTQ+ students (at school) is widespread even in countries with inclusive policies. Schooling practices are both gendered and sexualized consistent with dominant norms. Many schools make explicit gender and sexuality binaries in curricula, pedagogies, and school culture, assuming that learners identify as heterosexual and embody heteronormative gender expression and expectations **(WG2-ch4)**.

Racial/ethnic and language minorities: Retention to higher grades of education of racial/ethnic and language minority groups has increased to varying degrees across countries. However, with a few exceptions, students with an immigrant background (first and second generations) underperform on standardized learning assessments such as PISA compared to those otherwise **(WG2-ch4)**.

Disability, learning disabilities, and neurodiversity: Equal education opportunities for children with physical and neurobiological disabilities/differences has not yet been achieved. Children with disabilities/differences, especially in Global South countries, are less likely to

COMPARISONS OF PERCENTAGES OF NEITHER EMPLOYED NOR IN EDUCATION OR TRAINING (NEET) BETWEEN GENDER ACROSS THE WORLD

SOUTH-SAHARAN AFRICAN

Boys: **13%**

Girls: **22%**

SOUTH ASIA

Boys: **8%**

AFRICA

Boys: **13%**

Girls: **13%**

WORLDWIDE

Boys: **10%**

Girls: **25**
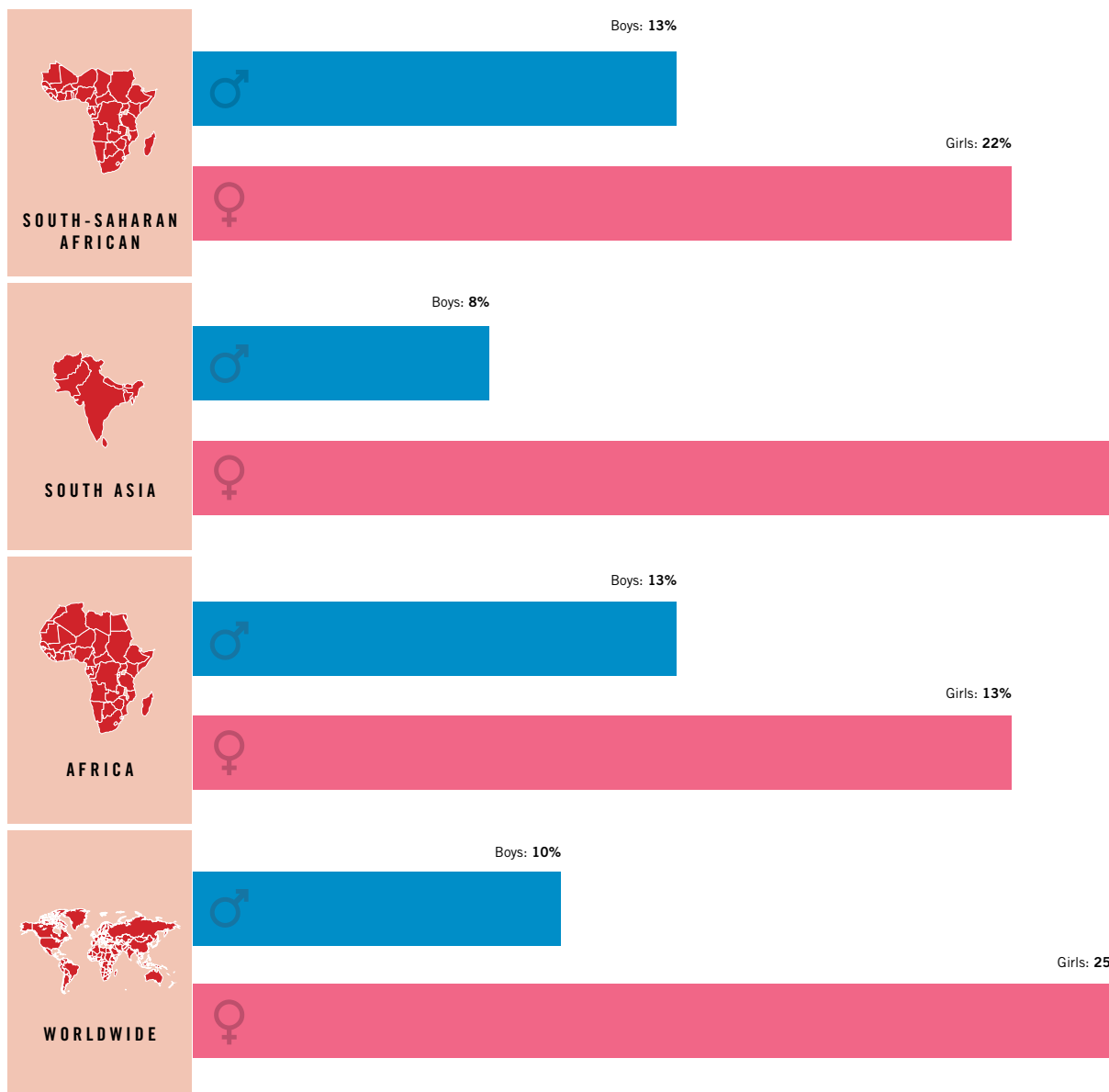
Figure 1.5. Comparison of Percentages of NEET between Boys and Girls
Source: UNICEF (2020) Gender and Education[7]

[7] https://data.unicef.org/topic/gender/gender-disparities-in-education/

Girls: **33%**

%

enter school and have lower primary and (even less) secondary school completion rates than their peers **(WG3-ch3, ch6)**. Students with specific learning differences (SLDs) (termed as a disability in most countries), such as dyslexia, dyscalculia, and dysgraphia, particularly when combined with mental health problems, have lower school achievement than otherwise or those with only one identified impairment **(WG3-ch6)**.

The same holds for students with neurodevelopmental disorders, such as attention deficit hyperactivity disorder (ADHD), autism, and other mental health problems. Neuro-disability, such as acquired brain injury, is highly prevalent but often neglected or misinterpreted in education settings, particularly in poorer and more vulnerable populations. Neuro-disabilities contribute to school exclusion and poor educational attainment. In addition, teachers often lack the expertise and tools to recognize and meet the needs of students with (learning) disabilities/differences or difficulties **(WG2-ch4; WG3-ch6).**

It is important to recognize that inclusive education does not mean that a student cannot receive specialized help outside the classroom or even

in special schools established for their particular disability or difference. Detractors of inclusive education advocate for separate education provision for students with disabilities/differences on the grounds that it serves their needs. On the other hand, critics of special education describe it as discriminatory and exclusionary **(WG3-ch6).**

These findings should be interpreted when considering that information about enrolment rates, learning levels, and completion rates for primary and secondary education levels among persons with disabilities/differences is limited. Between 2015 and 2020, 40% of countries did not collect data on prevalence, school attendance, and school completion for students with disabilities/differences, limiting informed and effective policy making to close gaps in access and learning **(WG2-ch4; WG3-ch6).**

How has context shaped educational policies and

and prac-
tices over
the past
50 years?

Key variables shaping education policies and practices include economics, politics, environment (ecology), technology, and social-cultural factors at the meso level, which influence education through policies and practices at the micro level **(Boxes 2 and 3 in the ISEE Assessment Conceptual Framework)**. Key influences at the micro level include curricula and pedagogies, teachers, and learner assessments.

KEY FINDING

2.1

The emergence of quasi-markets, shadow education, and a global education industry have further entrenched standardization of curricula, learner assessments, and modes of instruction (WG2-ch3).

The private sector through quasi-markets,

shadow education and a global education industry is increasingly influencing education with an emphasis on economic efficiency at the cost of learning and flourishing.

The emergence of quasi-markets, shadow education, and a global education industry have further entrenched standardization of curricula, learner assessments, and modes of instruction **(WG2-ch3)**. Shifts in views on the ways in which education is provided allow for an increased role for the private sector. This is widely associated with neo-liberalism **(WG2-ch1, ch3)**, according to which government policy deliberately encourages marketization in public schools to improve efficiency and supports expansion of the private sector. In tertiary and other non-compulsory education, this has introduced fees, which are sometimes underpinned by loan programs **(WG2-ch3)**.

Many governments have introduced a hybrid of joint public and private funding for schools **(see Figure 2.1) (WG2-ch3)**. This commodifies and commercializes education, shifting it from a public social good to a private good. School choice is up to families; the freedom to choose schools exerts pressure by creating an educational quasi-market that is perceived to be more effective in improving the school system than the traditional control exercised

by public authorities. Critics of school choice argue that the main assumptions of market advocates are divorced from reality **(WG2-ch3)**, with segregation in the school system the likely effect of school choice with potentially adverse consequences for equity **(WG2-ch3)**. Better-off families can take better advantage of choice opportunities than poorer families **(WG2-ch3)** reinforcing "hereditary meritocracy". Schools prefer students from high-income families and/or with high ability, triggering reverse selection dynamics (schools choose the families rather than families selecting the school **(WG2-ch3)**. Further, parents choose schools with a higher socio-economic level, expecting a high socio-economic environment to provide a better peer group or more academically able peers **(WG2-ch3)**. However, the results tend to be negative in terms of educational inequalities, inclusion, and school segregation. At the school level, these take the form of low teacher satisfaction **(WG2-ch10)**, learning for "exam" preparation **(WG2-ch9)**, curriculum standardization **(WG2-ch8)**, and neglect of students' non-cognitive outcomes and skills **(WG3-ch4)**. Specifically, deregulated and market-like voucher and charter schools' programs exacerbate school segregation and educational inequalities **(WG2-ch3)**.

THE WORLD BANK PPP CONTINUUM CONCEPT

**LOW PPP
(100% PUBLIC)**

**HIGH PPP
(100% PRIVATE)**

LACKS	NASCENT	EMERGING	MODERATE	ENGAGED	INTEGRAL
Strictly Public Systems	Private Schools Exist	Subsidies to Inputs in Private Schools	Contracts with Private Schools	Private Management of Public Schools	Vouchers; funding follows students
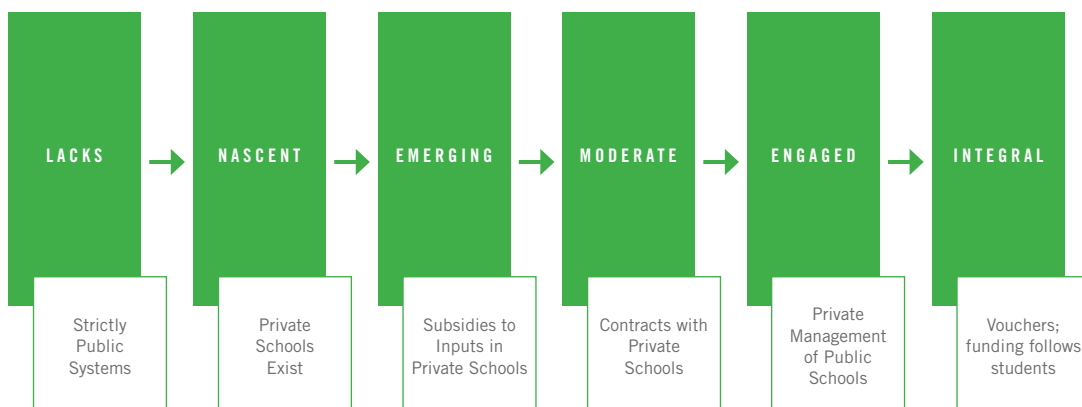
Figure 2.1. The World Bank Public-Private Partnership (PPP) continuum)
Source: Adapted from Patrinos et al. (2009, Figure 2.1, p.16). The Role and Impact of Public–Private Partnerships in Education. World Bank[8].

[8] https://openknowledge.worldbank.org/bitstream/
handle/10986/2612/479490PUB0Role101OFFICIAL0USE0ONLY1.pdf?sequence=1

2.2

Dominant-group political, economic, social and cultural factors have played a key role in excluding marginalized minorities in education and learning.

Dominant group culture—political, cultural, religious, racial—and poverty marginalize people of color, religious minorities, the disabled, and non-heterosexuals (WG2- ch4; WG3-ch6).

Dominant group culture—political, cultural, religious, racial—and poverty marginalize people of color, religious minorities, the disabled, and non-heterosexuals **(WG2-ch4; WG3-ch6)**. Most countries officially aim for equal education opportunities for all citizens regardless of racial, ethnic, and linguistic heritage, at least in their constitutions or in other legislation **(WG2-ch4)**. However, countries formulate specific policies and practices to achieve this goal differently. How they do so largely depends on their socio-cultural historical roots, which may include colonization, slave trading, conflict or warfare, refugees, state policy, historical exclusion, and guest workers.

In various countries, education opportunities for LGBTQ+ students are hindered by criminalization of homosexual acts. In countries where inclusive education policies exist and teacher-training is available, whole school programs are rare and lack documentation. Sexual differences are marginalized or silenced in many schools. Even countries with anti-discrimination legislation rarely recognize intersexuality.

Approaches to address *racial, ethnic, and language diversity* have generally moved from assimilation to intercultural understanding, focusing on critical multiculturalism. Most countries have inclusive policies on race/ethnicity/ language but, in practice, education systems are based on the majority or dominant groups **(see KF 3.2)** with worse outcomes for minority groups **(see KF 1.6) (WG2-ch4)**. Education policies addressing diversity in religion broadly emphasize learning into religion, about religion, and from religion. Learning into religion can be problematic when schools develop an exclusive understanding of religion that poses a threat to diversity **(WG2-ch4)**.

Inclusive education for students with disabilities/ differences faces challenges in relation to policy implementation and monitoring, as well as teacher preparation, support, and resources. Socio-cultural barriers may limit funding or deny learning difficulties. They may also prevent acknowledgement of the right to education for students with special needs **(WG2-ch4; WG3-ch6)**.

These forms of diversity are intertwined with each other and with social class, reinforcing disadvantage and oppression **(WG2-ch3, ch4)**. Poverty runs like a thread through the lives of many minority groups. It is one of the major environmental risk factors for suboptimal neurocognitive and brain development and for the development of learning difficulties **(WG3-ch2,ch3,ch6)**. Halting this downward spiral remains a challenge.

KEY FINDING

2.3

Local social and cultural factors have played an instrumental role

in producing imbalances in gender parity in education even if international political commitments to gender parity have strengthened over the past 30 years.

Social and cultural factors produce imbalances in gender parity in education even if international political commitments to gender parity have strengthened over the past 30 years.

Social and cultural factors produce imbalances in gender parity in education even if international political commitments to gender parity have strengthened over the past 30 years.
In the Global South, girls' education is hindered by forced child marriage and child and teenage pregnancy. Every year, in South Asia, Sub-Saharan Africa, and parts of Latin America and the Caribbean, 12 million girls are victims of forced marriage **(WG2- ch4)**. Girls drop out of school early to marry or in the wake of pregnancy **(WG2- ch4)**. Heteronormativity impacts girls' participation in schooling, because "within societies that see girls' futures solely as wives and mothers and doing domestic labor of caring for families, it makes little sense to send girls to formal school" **(WG2- ch4)**.

The 2030 SDG includes a specific target for gender equality in access to higher education **(WG2- ch4)**. Progress toward gender parity is mapped in UNESCO's 2020 global education monitoring report on gender, **(see Figure 2.2)**. While countries in the Global North have achieved greater gender equality in educational participation, there is room to improve. For example, in the US, males are more likely than females to achieve a high school diploma or equivalent. In urban areas, 42% of males graduated, compared to 25% of females **(WG2- ch4)**.

KEY FINDING

2.4

Education has become a major victim of violent conflicts

because it represents the state's economic, social, and political visions. However, incorporating new insights about the impact of stress and trauma on the developing and learning child can make education a peacebuilder by building social and emotional competencies, executive function and agency among learners (WG2–ch5; WG3–ch4).

> Conflict has been a key factor in shaping education. Education has become a major victim of violent conflicts because it represents the authority of the state, and schools are widely spread across the state territory, representing the state's economic, social, and political visions.

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By the end of 2019, violent conflicts and natural

PROGRESS TOWARDS GENDER PARITY VARIES AROUND THE WORLD
GENDER PARITY INDEX FOR GROSS ENROLMENT RATIOS BY LEVEL

Pre-Primary

1.4	
1.2	
1.0	
0.8	
0.6	
0.4	

Primary

1.4	
1.2	
1.0	
0.8	
0.6	
0.4	

Lower Secondary

1.4	
1.2	
1.0	
0.8	
0.6	
0.4	
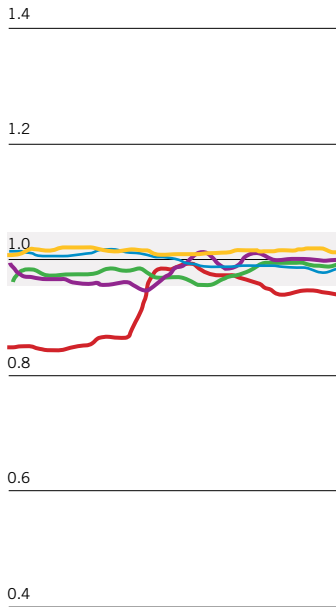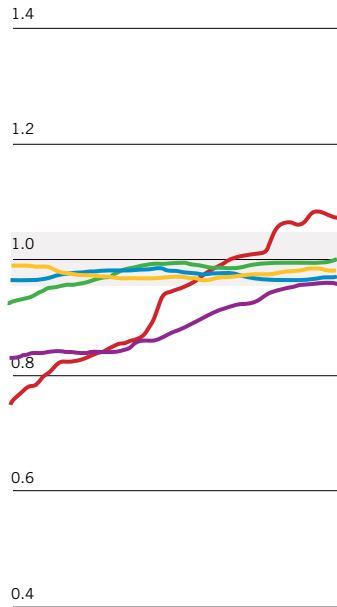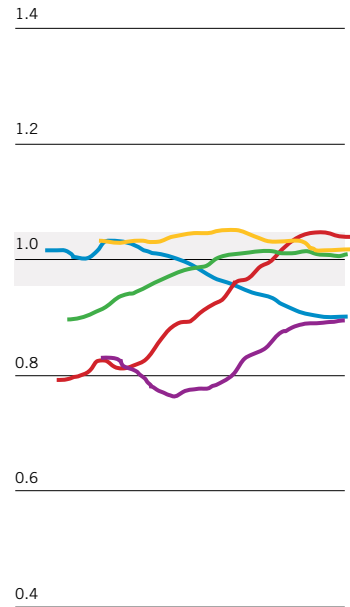
- Sub-Saharan Africa
- Central and Southern Asia
- Eastern and South-eastern Asia
- Latin America and the Caribbean
- Oceania

Upper Secondary
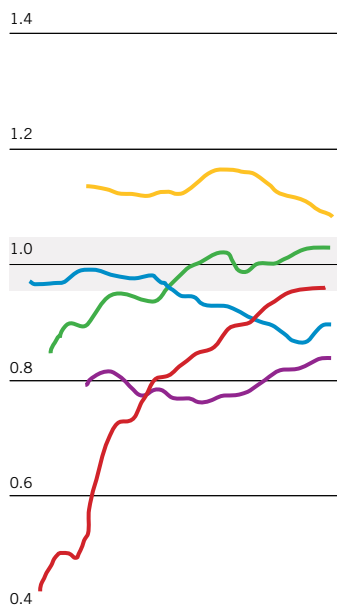
Tertiary
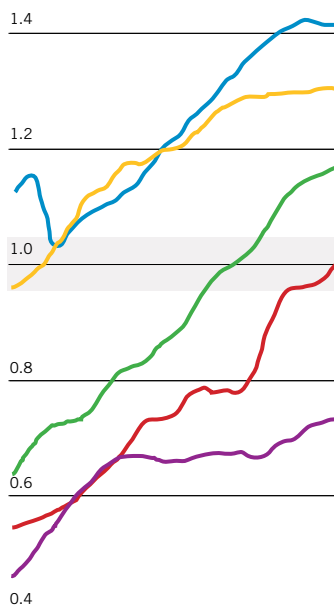
Figure 2.2. Gender Parity across the World[9]
Source: Adapted from UNESCO (2020) Global Education Monitoring Report – Gender Report: A new generation: 25 years of efforts for gender equality in education[10]

This graphic was designed for the GEM Report SCOPE website. www.education-progress.org
Selection: geo
Source: UIS database, 2019. Accessed: Aug 17,2021

disasters caused the forced displacement of 79.5 million people worldwide, 24 million of whom have been living as refugees **(WG2- ch5)**. Around half the refugee population is under the age of 18 with less than half having access to education. Approximately 37% of primary school–aged refugee children are out of school and only 24% have access to secondary education as shown in Fig 2.3. Access to higher education is a dismal 3% among refugee populations **(WG2- ch5)**.

Refugee youth face the risk of being recruited in

armed groups and/or forced into child labor and sexual exploitation. Worryingly, the refugee crisis is becoming increasingly protracted **(WG2- ch5)**, prolonging vulnerability and marginalization for both displaced and host communities **(WG2- ch5)**.

A lack of conflict sensitivity in education may be socially destructive when it: fails to address problems faced by displaced populations; maintains a segregated and unjust educational provision; promotes biased history through curricula and textbooks that inadequately

address the effects of displacement by conflicts; and maintains exclusionary educational practices in which ethnic, cultural, and religious minorities are deprived of their right to learn in their mother–tongue **(WG2- ch5)**. Education can also play an important role in liberation and peacebuilding. Knowledge of the associations between stress, trauma, and executive functioning abilities **(WG2- ch5; WG3-ch2)** can support educational innovations that enhance the role of education in liberation and peacebuilding.

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[9] https://www.education-progress.org/en/articles/equity#gender

[10] https://en.unesco.org/gem-report/2020genderreport

At classroom level, simple innovations to nurture a culture of peace can be implemented, encouraging the development of effective self-regulation, facilitating engagement in learning. For example, promoting individual agency by engaging children in decision making can increase self-regulation and executive function. Evaluations of a number of prekindergarten and kindergarten programs demonstrate this effect has sustained impact over later primary grades **(WG2- ch5; WG3- ch5)**.

HALF OF THE POPULATION IS UNDER THE AGE OF 18 (12 MILLION)

● All the Refugees (24 million)

LESS THAN HALF HAD ACCESS TO EDUCATION (6 MILLION)

● All the Refugees (24 million)
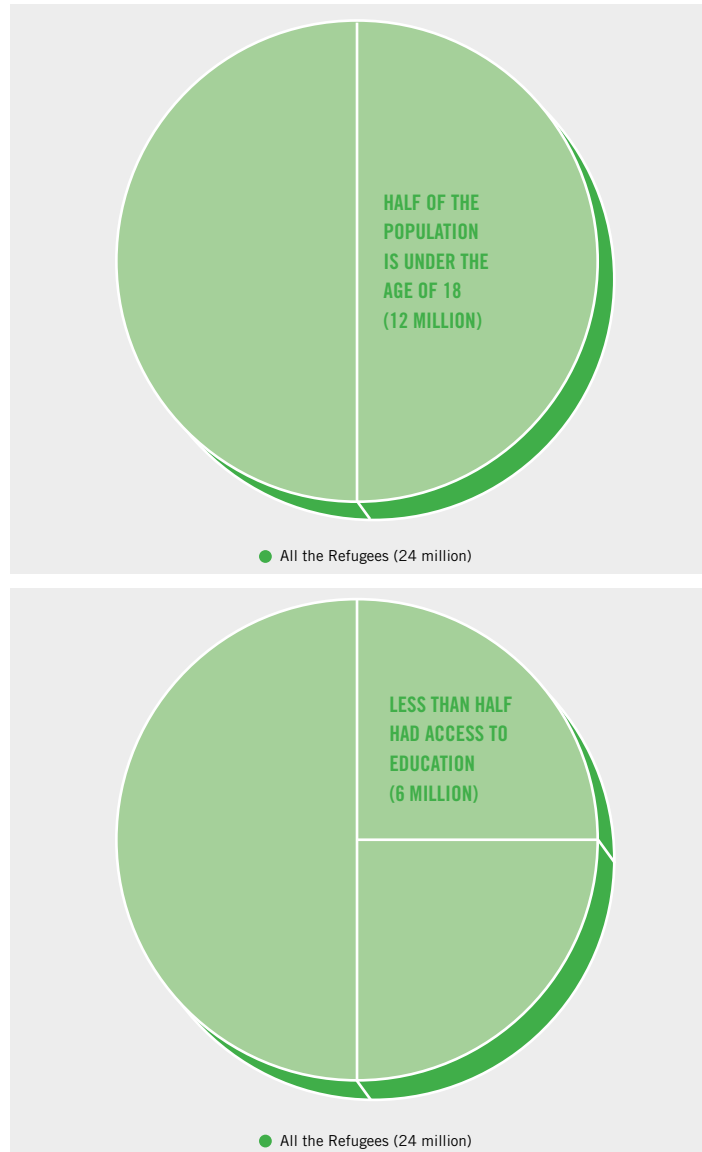
Figure 2.3. Refugee Education
Data Source: UNHCR(2020[11]) (WG2-ch5)

[11] https://www.unhcr.org/uk/figures-at-a-glance.html

KEY FINDING

2.5

Education Technology (EdTech) or Digital Pedagogy can help all students,

in particular students with special needs to concentrate on tasks and provide opportunities in simulations, basic drills/practice, and communication, while also increasing higher-order thinking and aiding pedagogical practices.

Advances in digital technology support children with special education needs.

Advances in digital technology support children with special education needs. Educational Technologies (EdTech) provide opportunities for differently abled students to learn. It can help individuals with special needs to concentrate on tasks, providing opportunities in simulations, basic drills/practice, and communication. It can also increase higher-order thinking skills **(WG2-ch6)** and aid pedagogical practices.

For example, artificial intelligence in educational development (AIED) provides robust tools for the development of personalized learning for students with social anxiety, autism spectrum disorder, and specific learning difficulties, such as dyslexia and dyscalculia. Emerging developments in robotic design provide social robots that are valuable tools for social-emotional learning **(WG2-ch6; WG3-ch6).**

However, EdTech's main disadvantages are the lack of direct social interaction, inefficient explanations compared to traditional methods, and the requirement of strong self-control and discipline on the part of the student **(WG2-ch6)**. The digital divide within and across countries is another major constraint that may perpetuate existing inequities.

Also, much of the results associated with the benefits of EdTech suffer from the WEIRD (Western, highly educated, industrialized, rich, and liberal democratic countries–regions) problem. Thus there is a need for research and teacher–training in how to adapt and align to specific educational contexts across nations, regions, and cultures. This is a critical issue when data generated by homogenous populations are used to design AI interventions, which might result in bias and unpredictable outcomes **(WG2-ch6).**

KEY FINDING

2.6

The UN Sustainable Development Goal 4,

Target 7 remains at the periphery of most education systems even as Climate Change and other major environmental problems have spurred an increase in the adoption of education for sustainable development (ESD), global citizenship education (GCED), and environmental education. These subjects are yet treated as 'minor' subjects in school curricula, with little or no social and emotional dimensions, leading to limited efficacy of these interventions.

Climate change issues coupled with other major environmental problems have spurred an increase in the adoption of education for sustainable development (ESD), global citizenship education (GCED), and environmental education. However, emphasis on knowledge acquisition with limited social and emotional dimension has limited the efficacy of these interventions.

Figure 2.4. Learning Dimensions in Formal Education
Source: Adapted from UNESCO (2019, Figure 5, p. 7)[12]. Country progress on climate change education, training and public awareness: an analysis of country submissions under the United Nations Framework Convention on Climate Change

Climate change issues coupled with other major environmental problems have spurred an increase in the adoption of education for sustainable development (ESD), global citizenship education (GCED), and environmental education. However, emphasis on knowledge acquisition with limited social and emotional dimension has limited the efficacy of these interventions.

Most references to climate change education relate to public awareness rather than integration into the school curriculum. In most countries, at all levels of formal education, cognitive learning takes precedence over SEL and behavioral change. Yet these are crucial in shifting attitudes to the environment **(see Figure 2.4)**. A 2021 study by Van Doesum et al. "social mindfulness and prosociality vary across the globe" shows a positive correlation between social mindfulness and Environmental Performance Index.

FIGURE 5: LEARNING DIMENSIONS IN FORMAL EDUCATION

Legend:
- Primary Education
- Secondary Education
- Tertiary Education

PERCENTAGE OF ALL REFERENCES

COGNITIVE (N=38): Primary 67%, Secondary 63%, Tertiary 75%
SOCIAL AND EMOTIONAL (N=5): Primary 7%, Secondary 4%, Tertiary 25%
BEHAVIOURAL (N=14): Primary 27%, Secondary 33%, Tertiary 0%

LEARNING DIMENSIONS

Note: Percentages sum to 100% across each level of education

[12] https://unesdoc.unesco.org/ark:/48223/pf0000372164

How has context, together with education policies and practices, influenced

03

How has context, together with education policies and practices, influenced "what we learn", "how we learn", "when we learn", and "where we learn"?

"what we learn", "how we learn", "when we learn", and "where we learn"?

KEY FINDING

3.1

Many national curricula emphasize knowledge acquisition and not social and emotional learning.

The former is focused on literacy and numeracy using standardized curricula as opposed to focusing on localized curricula addressing existential questions faced in students' day-to-day life.

Many nationalized curricula emphasize knowledge acquisition focused on literacy and numeracy using standardized curricula, assessments, and (teacher) monitoring. Standardization has shifted education from localized curricula that address existential questions faced in students' day-to-day life. Building social and emotional competencies is increasingly included, especially in the Global North, but is still peripheral (WG2-ch8; WG3- ch4, ch5).

Many nationalized curricula emphasize knowledge acquisition focused on literacy and numeracy using standardized curricula, assessments, and (teacher) monitoring. Standardization has shifted education from localized curricula that address existential questions faced in students' day-to-day life. Building social and emotional competencies is increasingly included, especially in the Global North, but is still peripheral **(WG2- ch8; WG3-ch4, ch5).**

Curriculum constitutes, broadly speaking, the "content" or "what" of education, while pedagogy concerns "how" the "what" occurs **(WG2-ch8)**. Curricula and pedagogies across the world are heavily shaped by politics **(WG2-ch3, ch8)**, including by experiences of colonialism (perpetrator, victim, or both), legacies of conflict **(WG2-ch5, ch8)**, nation-building agendas (especially in newly independent states), and culture or tradition (as interpreted by dominant vested interests) **(WG2-ch4, ch8)**. For example, in formerly occupied countries, the European language and structures introduced during colonial rule remain intact in education **(WG2- ch8)** despite research emphasizing the importance of mother-tongue instruction **(WG3- ch5)**, which not only supports literacy learning but enables participatory learning and helps students to express ideas using the full breadth of their vocabulary. Instruction in colonial languages excludes those without mastery of that language, replicating economic, social and political inequality **(WG3- ch5)**.

Concepts of economics and neo-liberalism that see the purpose of education as human-capital building have increasingly influenced education policy, curricula, and assessment **(WG2-ch8)**. "Accountability" is associated with measuring "outputs", which, in the ideal of a knowledge-based economy, emphasize literacy, numeracy, and science. Teachers' productivity and efficiency are also monitored and measured, via PISA, TIMSS, and other rankings, in turn driving a curriculum and pedagogy of performativity and accountability. Measurement is often confused with value, so that the core purpose of education is marginalized, an effect that is evident in curricula from kindergarten to university.

Meanwhile, skills such as teamwork, commitment, and empathy, as well as the socialization function of education are devalued. In addition, standardization has resulted in education being less relevant, responsive, and reflexive for teachers and learners **(WG2- ch8)**. Yet, learning is inherently social, emotional, relational, and affective. Although SEL is increasingly integrated in curricula across the world, its formative and dynamic learner assessment is lagging in most nations **(WG3- ch4)**.

KEY FINDING

3.2

Increased understanding and respect for diversity is slowly gaining momentum in curricula

and school systems but can be further strengthened by mainstreaming it across curricula, pedagogy, learner assessments and teacher training.

Educational institutions increasingly include "minority" studies, recognizing biological and especially neurobiological diversity and plurality within societies and minimizing the universality of the dominant group's worldviews (WG2-ch4).

Educational institutions increasingly include "minority" studies, recognizing biological and especially neurobiological diversity and plurality within societies and minimizing the universality of the dominant group's worldviews **(WG2- ch4)**.

In recognition of diversity and inequality, advocates call for the inclusion of minoritized groups' worldviews in determining school curricula, assessment and selection criteria, and pedagogies. While officially advocating for the goal of 'equal educational opportunities', governments variously prioritise different forms of diversity, guided by historical, political, social and economic contexts. Policy implementation varies across societies and can be enhanced by effective monitoring, increased funding and relative autonomy of local actors to interpret policies to suit local circumstances. Teachers play critical roles, calling for well designed pre-service teacher education programs with teacher educators representing the diversity **(WG2- ch4)**.

KEY FINDING

3.3

EdTech is pervasive across all education settings and shows much promise

in providing the possibility of personalized learning if it is designed and implemented in an ethical, inclusive and equitable manner. This promise takes on special importance for individuals with specific disabilities or challenges that impact their learning in traditional school settings, to communities that are geographically remote, and to populations in economic need.

EDTECH ALLOWS
ACCESS TO QUALITY
EDUCATIONAL
RESOURCES FOR

Individuals with specific disabilities or challenges that impact their learning in traditional school settings

Communities that are geographically remote

Populations in economic need

Figure 3.1. The Reach of EdTech

EdTech, especially the revolution in digital education, has had profound effects for individuals with specific disabilities or challenges that impact their learning in traditional school settings, to communities that are geographically remote, and to populations in economic need. There has been an explosion in the use of EdTech during the COVID-19 pandemic **(WG2-ch6, ch8)**.

The evolution of EdTech promises new ways of learning and instructional tools and enhances the role of teachers and other educators in supporting human learning, affecting "what, how, and where we learn", both for better and for worse **(WG2-ch6; WG3-ch3, ch6, ch7)**. **Figure 3.1** illustrates its reach and **Figure 3.3** shows the digital divide across regions and countries. **Table 3.1** outlines new ways of learning and instructional tools. Other developments include advances in computational linguistics, 3D printers, and social robotics **(WG2- ch6)**.

EdTech, especially the revolution in digital education, has had profound effects for individuals with specific disabilities or challenges that impact their learning in traditional school settings, to communities that are geographi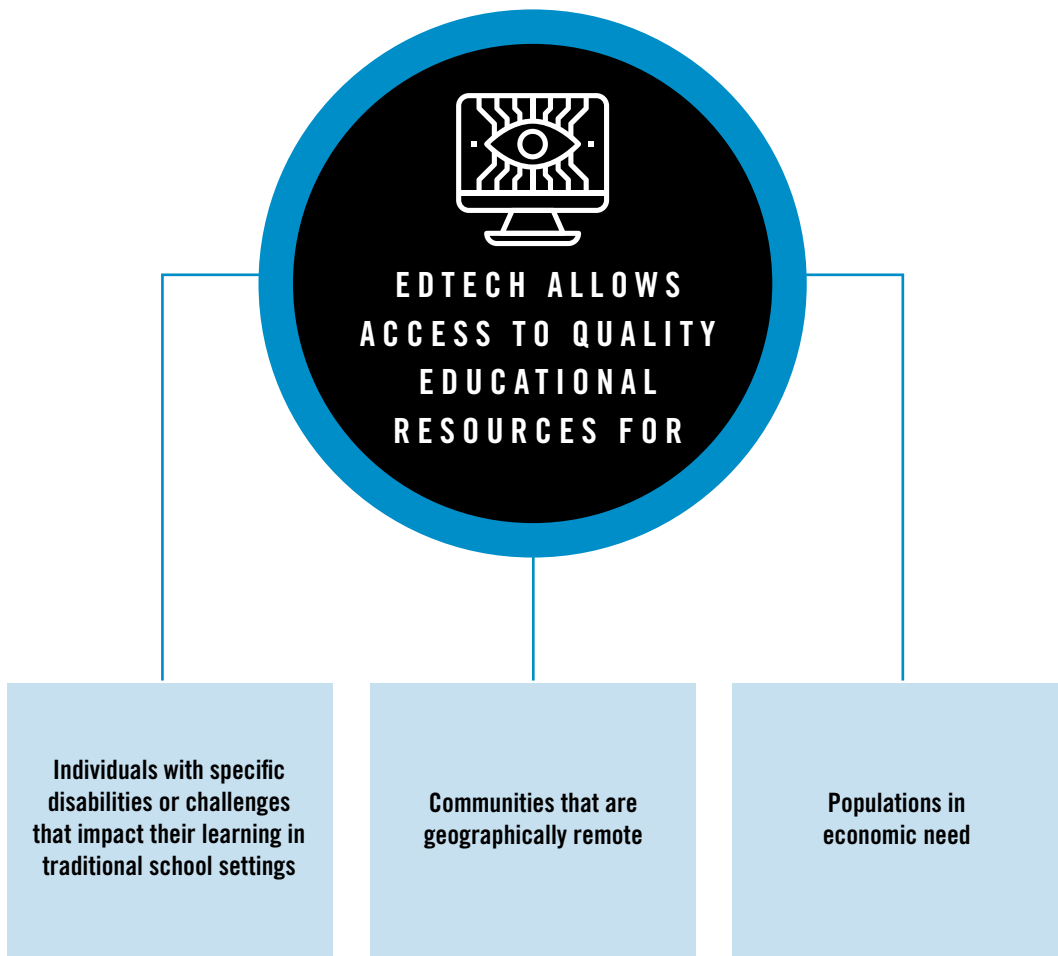cally remote, and to populations in economic need. There has been an explosion in the use of EdTech during the COVID-19 pandemic (WG2-ch6, ch8).

Although teaching and learning traditionally occur within a classroom **(WG3-ch7)**, a significant shift in digital technology is transforming teaching **(WG2-ch8)**. Meta-analyses comparing technology-mediated instruction and teachers' pedagogical interventions (e.g., providing feedback, teacher–student relationships, meta-cognitive strategies, and direct instruction) indicate an effect size in learning that is about twice as large for teachers' quality interventions. The effect size of fully online learning is similar to face-to-face learning, while for blended instructions it is greater than for solely face-to-face learning **(WG2- ch6)**. However, with the many strengths of EdTech come some weaknesses which if left unattended will inhibit the effectiveness of and equitable use of EdTech **(WG2-ch6) (see Figure 3.2).**

STRENGTHS
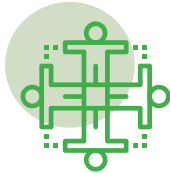
Connecting learners across geographical distances
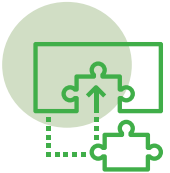
Personalized learning
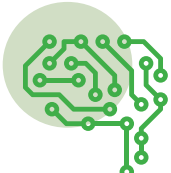
Artificial Intelligence (AI) adaptive tutoring systems
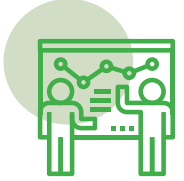
Hybrid models of in-person and remote education
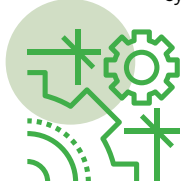
EdTech tools such as games,virtual dialogic platforms, content search optimization options

WEAKNESSES
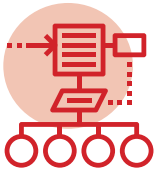
Algorithm bias in AI powered language platforms
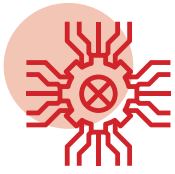
Widens digital divide leading to inequitable outcomes
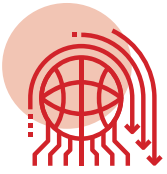
Low Quality and Misinformation

Privacy Protection

Figure 3.2. The Strengths and weaknesses of EdTech

	WHAT IS IT?	**WHAT ARE ITS BENEFITS?**
	In-person and remote/virtual education	Teacher-training
Hybrid Learning Models	-Computer supported collaborative learning (CSCL)	- Enriches learning interactions - Creates opportunities for sharing and constructing knowledge in groups (WG2-CH6)
Intelligent Personalised Adaptive Tutoring Systems	- Records students' knowledge, skills, and psychological characteristics, uses these insights to generate adaptive responses to help students learn or stay engaged - Provides artificial intelligence based assessment in tutoring systems	- Promising learning gains compared to conventional learning activities such as attending lectures or reading - Rigorously, continuously, and stealthily evaluates students progress/level providing timely information to different stakeholders
Educational Games	-Assesses learning continuously, assesses socio-emotional development, cultivates perspective-taking, employs culturally sensitive differentiated tools	- Mixed success in improving learning, but further engineering and research is promising (WG2-ch6)
Video-Conference Platforms	-An alternative or supplement to in-person classrooms	- Can reach remote areas - Connects people and ideas across time and space leading to local/community learning and engagement

Table 3.1. New Ways of Learning and Instructional Tools

KEY FINDING

3.4

Where we learn influences what and how we learn,

in some cases beyond the intended curriculum, learner assessment or aims of education. Flexible and/or open classrooms which enable group learning and agency improve student cooperation, cognitive learning, student engagement and well-being.

> Where we learn influences what
> and how we learn,
> in some cases
> beyond the intended
> curriculum, learner
> assessment, or
> aims of education.
> Vice versa, ideas
> about what and how
> we learn (best) also
> influence where we
> learn (WG2-ch5,
> ch6, ch8; WG3-ch3,
> ch7).

Where we learn influences what and how we learn, in some cases beyond the intended curriculum, learner assessment, or aims of education. Vice versa, ideas about what and how we learn (best) also influence where we learn (**WG2-ch5, ch6, ch8; WG3-ch3, ch7**).

Where education takes place (i.e., the learning space be it built, natural, or digital **(see Key Finding 3.3)**), matters for what and how we learn—cognitive, socio-emotional, or behavioral learning—intentionally or unintentionally. Who has access to different kinds of

learning spaces also limits or enables what can be learned. Inequities of race, colonization, region, gender, income, ability, and other factors shape access to various types of built, natural, and digital learning spaces, and hence people's access to learning and their experiences of it **(WG3-ch7)**.

In the past 30 years, school design has largely been informed by psychology and neurosciences, and is aimed at enhancing academic progress via light, sound, temperature, and air quality. Current school design is sensitive to intersections of climate, culture, natural

INTERNET USERS PREDOMINATE ACROSS REGIONS,
EXCEPT IN AFRICA

*Regional medians of adults who use the internet at least occasionally
or report owning a smartphone*

U. S.

EUROPE

MIDDLE EAST

LATIN AMERICA 64%

ASIA/PACIFIC 58%

AFRICA 25%
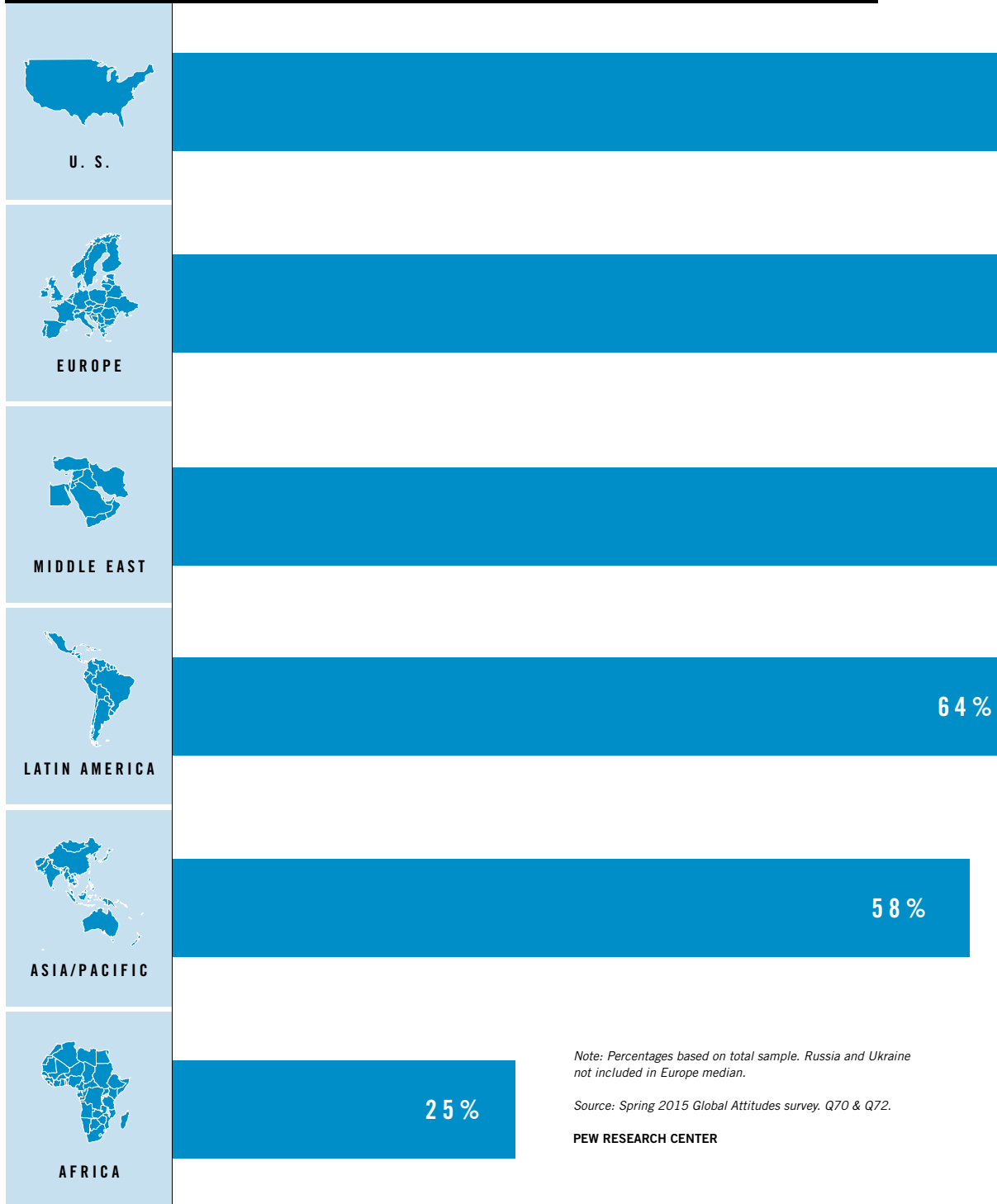
Note: Percentages based on total sample. Russia and Ukraine
not included in Europe median.

Source: Spring 2015 Global Attitudes survey. Q70 & Q72.

PEW RESEARCH CENTER

89%

80%

72%

materials, and contemporary teaching methods to address education as an SDG and to include diverse populations (e.g., differently abled and indigenous people). However, education is increasingly marketized with universities, in particular, distinguishing themselves visually and commercially, extending the school building from a place of learning to a commercial function **(WG3- ch7)**.

The ISEE Assessment notes increased research interest in the ways built environments can influence educational outcomes. The research literature shows that school designs can affect learning, including attainment, engagement, perceptions of student–teacher interactions, interpersonal competencies, wellbeing, and behaviors **(WG3- ch7)**. For example, more flexible and/or open classrooms that enable group learning and cooperation and improve student agency are associated with improved cognitive learning, student engagement, and wellbeing **(WG3- ch7)**. There is initial, but limited, evidence that sustainably designed schools can act as pedagogic tools that influence children's environmental attitudes and behaviors **(WG3- ch7; WG2- ch8)**. However, causality is hard to determine, and evidence is lacking, as well as being limited to the 20th century, school architecture, and the Global North.

Also, learning experiences are often designed to occur in, or in relation to, the natural or non-built environment, including outdoor and environmental learning, community and place-based learning, interspecies (i.e., animal) learning, and indigenous land-based learning. These learnings often surpass formal and non-/informal education programming by providing unintended or hidden learning taken from the ways in which learners implicitly interact with the places and world around them **(WG3- ch7)**.

MOST ADULTS IN ADVANCED ECONOMIES USE INTERNET, DEVELOPING COUNTRIES LESS SO.

Country	
SOUTH KOREA	
AUSTRALIA	
CANADA	
U.S.	
UK	
SPAIN	
ISRAEL	
GERMANY	
CHILE	
FRANCE	
PALEST. TER.	
ITALY	
RUSSIA	
TURKEY	
ARGENTINA	
JAPAN	
POLAND	
MALAYSIA	
JORDAN	
VENEZUELA	
LEBANON	
CHINA	
BRAZIL	
UKRAINE	
MEXICO	54
PERU	52%
VIETNAM	50%
SOUTH AFRICA	42%
KENYA	40%
PHILIPPINES	40%
NIGERIA	39%
SENEGAL	31%
INDONESIA	30%
GHANA	25%
INDIA	22%
TANZANIA	21%
BURKINA FASO	18%
PAKISTAN	15%
UGANDA	11%
ETHIOPIA	8%
GLOBAL MEDIAN	

Adults who use the internet at least occasionally or report owning a smartphone.

94%
93%
90%
89%
88%
87%
86%
85%
78%
75%
72%
72%
72%
72%
71%
69%
69%
68%
67%
66%
65%
60%
60%
%

These core understandings have many implications for education policy and practice in relation to the "best place" for learning and outcomes and in challenging assumptions that all types of learners can equally be engaged through existing practices **(WG3-ch4, ch5)**.

The COVID-19 pandemic has brought to the fore learning in the digital world. Students are connecting with each other from their homes through mobile phones, computers, tablets, and even televisions. The impacts are yet to be determined but studies suggest promising results if universal design principles are adopted **(WG2-ch6)**.

Figure 3.3. Digital Divide across Countries Based on Proportion of Internet Users
Source: https://www.pewresearch.org/global/2016/02/22/internet-access-growing-worldwide-but-remains-higher-in-advanced-economies/technology-report-02-08/

67%

HOW CAN EDUCATION BE RE-IMAGINED

How can education be reimagined to maximize human flourishing?

TO MAXI-MIZE HUMAN FLOURISH-ING.

KEY FINDING

4.1

Education as a social relational activity offers a pathway to develop human flourishing.

An education for human flourishing must be malleable and adaptable to accommodate the needs of the individual while recognizing societal and ecological conditions.

An education for human flourishing must be malleable and adaptable to accommodate the needs of the individual while recognising societal and ecological conditions **(WG3-ch4, ch5, ch2; WG2-ch7).**

The process of self-transformation involves living well as a human being in society and the optimal development of one's potential **(Fig 4.1)**. Education contributes to these two aspirations by ensuring

CONTRIBUTION OF THE INDIVIDUAL

- *Personal Values*
- *Humansitic Values*
- *Satisfying*

LIVING WELL AS A HUMAN BEING

OPTIMAL DEVELOPMENT OF HUMAN POTENTIAL

- *Capacity*
- *Propensity*
- *Capability*

- *Teaching*
- *Learning*
- *Evaluation*

EDUCATION AS MEANINGFUL ACTIVIY

EDUCATION AS HUMAN RELATION

- *Provocation*
- *Evocation*
- *Judgement*

ENABLING (SOCIO-CULTURAL, NATURAL AND ECONOMIC) ENVIRONMENT

Figure 4.1. Education as a Meaningful Activity and a Human Relation for Human Flourishing

An education for human flourishing must be malleable and adaptable to accommodate the needs of the individual while recognising societal and ecological conditions.

education is a meaningful activity and as a social human relation. Human flourishing can be enhanced by the explicit training (teaching and learning) of social-emotional skills **(WG3-ch4)** such as empathy, mindful awareness, and compassion in conjunction (with emphasis on conjunction) with cognitive skills such as numeracy and literacy **(WG1- ch3)**. The learning and development of these skills occur through structured practice over time **(WG1- ch3)**.

Flourishing involves community—it is interpersonal, not an individual pursuit **(WG1- ch3)**. Research informs us that we cannot thrive or flourish in isolation from community or by ignoring our responsibilities to others. This idea is based on the fundamental interdependence between one's own happiness and the happiness of others **(WG1- ch3, ch1,ch2,ch5; WG3-ch4)**.

KEY FINDING

4.2

Context heavily influences (and is influenced by) education and learning

and can either derail or nurture education for human flourishing. Therefore, political, social, cultural, institutional and technological factors need to be understood when designing an education to minimize unintended negative outcomes and achieve the goal of human flourishing.

A range of contextual factors (political, social, cultural, institutional, environmental, technological) influence interpretation of the diverse goals of education, and the capacity of education systems to meet these goals (WG 2-ch1).

A range of contextual factors (political, social, cultural, institutional, environmental, technological) influence interpretation of the diverse goals of education, and the capacity of education systems to meet these goals **(WG 2-ch1)**. Context (ecological, political, cultural, social and economic) shapes, and is shaped by, diverse understandings of what it means to lead a fulfilling life. These contextual factors also play a defining role in the way education is structured to meet these societal goals and aspirations **(WG2-ch1)**. Education systems do not, and cannot, stand apart from or outside their social context, but will always tend to mirror it. They thus reflect prevalent cultural and ethical assumptions regarding the ordering of society. Context can either derail or nurture education for human flourishing and therefore needs to be understood when designing an education for human flourishing to minimize unintended negative outcomes **(WG2-ch1, ch5,ch8,ch9)**.

However, if we recognize that education is not just a matter of acquiring 'skills' of literacy and numeracy

(although this is crucial), but is also about helping young people become responsible, engaged and fulfilled members of society then the potential of designing an education for human flourishing that mirrors societal aspirations and preferences over time might become a reality **(WG1-ch2,ch4; WG2-ch1, ch8; WG3-ch4)**

Our chances of realizing such a vision depend largely on the extent to which we are able to create socio-economic and political contexts in which education as human flourishing can thrive **(WG2-ch1)**. This reality emerges as the dynamic interplay between context influencing education and education influencing context produces an upward spiral towards individual and societal flourishing aiming towards a peaceful and sustainable world.

KEY FINDING

4.3

Cognitive, social-emotional and metacognitive

functions need to be mainstreamed in curricula and pedagogy and should be grounded in complex local and global issues related to politics, economics, cultural diversity and environmental sustainability. Fostering a symbiotic relationship between cognition, metacognition and social-emotional learning in education systems is key to activating and achieving the seven pillars of learning: learning to know, learning to think, learning to do, learning to be, learning to become, learning to live together and learning to live with nature.

Social-emotional and metacognitive functions need to be mainstreamed in curricula and pedagogy and should be grounded in complex local and global issues related to politics, economics, cultural diversity and environmental sustainability.

Social-emotional and metacognitive functions need to be mainstreamed in curricula and pedagogy and should be grounded in complex local and global issues related to politics, economics, cultural diversity and environmental sustainability. Fostering a symbiotic relationship between cognition and social-emotional learning in education systems is key to activating and achieving the seven pillars of learning.

Prioritizing human capital and academic performance in education can undermine human flourishing. Current brain research at the systems level (or whole-brain approach) reveals no clear distinction between cognition and emotion: they are interdependent and influenced by cultural (e.g., values, belief systems and practices) and environmental (e.g., socio-economic status) factors **(WG3-ch4, ch3)**. Learning is an interaction of multidimensional cognitive and emotional processes that are essential for academic and social and emotional learning. These include working memory, motivation, reward, selective attention, visual and auditory processes, executive function, emotional regulation, awareness, and reflection **(WG2-ch9)**. Therefore,

curricula and pedagogies must simultaneously nurture the social-emotional, metacognitive and cognitive domains (whole-brain approach) by including the following:

1. Building socio-emotional skills, including empathy for our shared home on earth as an extension of empathy for each other, linking individual and community resilience to environmental resilience **(WG1-ch3; WG2-ch8)**. Specifically, SEL fosters understanding of the complex challenges of politics, economics, cultural diversity, and environmental sustainability. This can raise awareness of the connection between issues like environmental degradation, biodiversity loss, pandemics like COVID-19, droughts that cause mass hunger, and other human challenges including climate change and climate fear and anxiety, which affects young people across the globe **(WG2-ch2).**
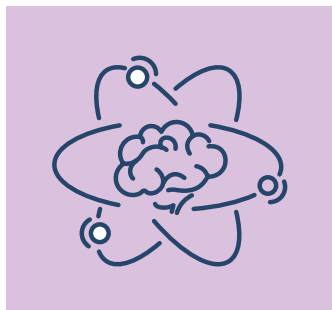
2. Building foundational metacognitive functions that develop self-regulation (executive functions and "learning to learn"), adaptive motivational attitudes (e.g., growth mindset) and agency to enhance resilience and learning opportunities **(WG3-ch3)** and nurture peacebuilding **(WG2-ch5).**

3. Content matters, and we must not lose sight of ensuring that learners also build their foundational skills in numeracy and literacy as these are essential for human development and flourishing

(WG3-ch5). However, we must remain aware of the ways in which curricula can not only contribute to, but also radically undermine, the pursuit of peace, sustainability and human flourishing **(WG2-ch1, ch3,ch4,ch6)**. Curricular content can play a crucial role in challenging or critiquing established norms and liberating minds, but it can also serve to legitimize and reinforce an unjust social and political order, narrowing minds and stoking resentment and hatred **(WG2-ch5)**. Seven pillars of learning emerged out of the research findings which seem to be foundational for human flourishing. These are: learning to know, learning to think, learning to do, learning to be, learning to become, learning to live together and learning to live with nature. A six-domain curricula program emerges as the minimum to activate these seven pillars with a strong emphasis on seeing these pillars as interconnected and achieved through the interconnected approach of combining cognitive and social and emotional learning in the education system **(WG1-ch2,ch4,ch5; WG3-ch4,ch5)**.

KEY FINDING

4.4

A broader cultural perspective that allows learning experiences

from learners across different parts of the world should be adopted to inform education and learning while social influences reinforcing gender, racial, religious and other stereotypes need to be minimized.

A broader and more tailored cultural perspective and awareness of the culture-dependent nature of learning and flourishing needed.

A broader and more tailored cultural perspective and awareness of the culture–dependent nature of learning and flourishing are needed. Culture guides brain maturation, modulates the effect of the environment on learning **(WG2-ch7; WG3-ch2, ch4),** and influences academic skills (e.g., different numeric and writing systems) across the globe **(WG3-ch5)**. Human flourishing is also culture-dependent **(WG1-ch2)**. However, accounts of child development are Western Eurocentric, highlighting the political and power dynamics around curricular knowledge. For example, the majority of research focuses on children in North America and Europe, yet less than 10% of the world's infants are born there. Moreover, most mainstream schools operate via the dominant culture (e.g., language of instruction, school curriculum, interpersonal interaction patterns, certain worldviews), undervaluing "others" and disadvantaging

their children **(WG2-ch 4; WG3-ch5**).

A reorganization of curricula towards hybrid learning ecologies is needed. Hybrid learning ecologies connect existential questions faced by the school and broader community with practical, local action. By seeking a more humanized approach to education, hybrid learning respects and recognizes the traditional knowledge of, for example, indigenous peoples, ancestry, and intergenerational dialogue as crucial for sustainability and opposes ethnic, racial, gender, and class oppression, as well as ableism, ageism, and the exploitation of human labor and the environment. It emphasizes doing better things in life rather than doing things better for the marketplace **(WG2-ch8)**. Teachers are critical actors here, partners with expertise who need to be consulted and involved in preparing the curriculum **(WG2-ch8)**.

KEY FINDING

4.5

A formative and dynamic learner assessment

encouraging continuous feedback to acknowledge and increase learner potentiality should be designed and implemented.

Learner assessment should shift from standardized, summative testing to formative and dynamic testing to acknowledge and increase potentiality, to prevent entrenching unequal chances for minority groups and different learners, and reduce test-related stress and the related impact on mental health.

Summative and standardized learner assessments (including large-scale assessments such as PISA) are unfair for disadvantaged and immigrant children (see Key Finding 1.4). Reimagining education requires a shift toward formative and dynamic testing that supports flourishing through emphasizing

> **Learner assessment should shift from standardized, summative testing to formative and dynamic testing to acknowledge and increase potentiality, to prevent entrenching unequal chances for minority groups and different learners, and reduce test-related stress and the related impact on mental health.**

individual, relative growth, based on teacher and student working together to enhance ongoing learning **(WG2-ch9)**. Dynamic assessment **(WG3-ch5)** measures students' learning potential, allowing for individualization and recognition of differing learning trajectories **(WG3-ch5)** including those of children with learning disabilities **(WG3-ch6)**, and is therefore in line with a focus on a learner's potentiality **(WG1-ch2)**. Behavioral, psychological, and neural data from educational neurosciences can help in understanding the mechanisms underlying learning and contribute to designing successful formative assessments **(WG2-ch9)**.
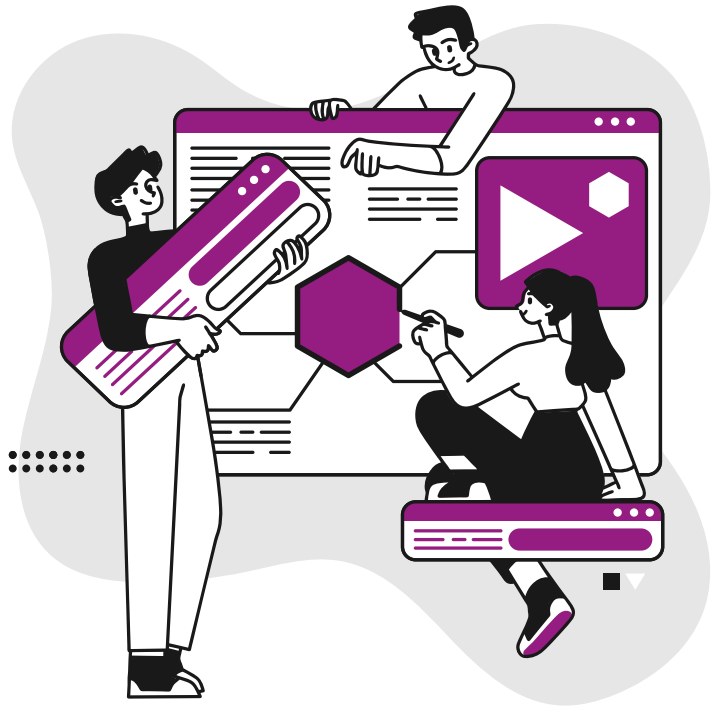
KEY FINDING

4.6

Design and implement inclusive education policies

by investing in early identification (or screening) of at-risk learners, teacher training, and EdTech.

Inclusive education policies need to be improved and implemented better by investing in early identification (or screening) of at-risk individuals, teacher-training, and EdTech.

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Child development and learning varies between individuals as it involves dynamic interactions among neurobiological, cognitive, socio-emotional, and environmental/cultural influences **(WG3-ch5)**. Learning difficulties are also complex and heterogeneous **(WG3-ch6)**. Individual differences in education are often driven by the intersection of broad societal factors and biology (e.g., policy-driven economic inequality and its effect on the brain) **(WG2-ch7; WG3-ch3, ch6)**, that is, educational outcomes cannot be predicted by one factor alone. Research and policy should examine the interacting factors (neurobio-psycho-social factors, see **WG3-ch3**; broader societal context, see **WG2-ch7**) that influence individual differences in education attainment. The goal of education should be to help each student reach their full potential **(WG3-ch6)**, guided by three overarching questions to develop the appropriate

intervention strategy for each learner **(see Figure 4.4)**.

Despite global acknowledgment of the importance of an inclusive approach to education, how and to what extent learning disabilities are identified vary across and within countries. No consensus has been reached as to whether there should be specialized schools or inclusive schools for equitable education. Also, teachers often lack competence, expertise, and tools to recognize and meet the needs of students with (learning) disabilities/differences or difficulties **(WG2-ch4, ch7; WG3-ch3,ch6)**, so improved teacher training is required **(see Key Finding 4.9)**.

The further development and use of EdTech should be supported **(Key Finding 2.5)** because digital technologies to support learning have proven to be effective in supporting children with special education needs **(WG2-ch6; WG3-ch6)**. However there must be a healthy balance between digital supportive technologies and regular classroom activities.

Q1

WHY DO SOME CHILDREN NEED EXTRA SUPPORT IN ORDER TO SUCCEED IN SCHOOL?

Q2

HOW CAN WE IDENTIFY CHILDREN'S DIVERSE LEARNING NEEDS?

Q3

HOW CAN WE SUPPORT ALL CHILDREN'S LEARNING?
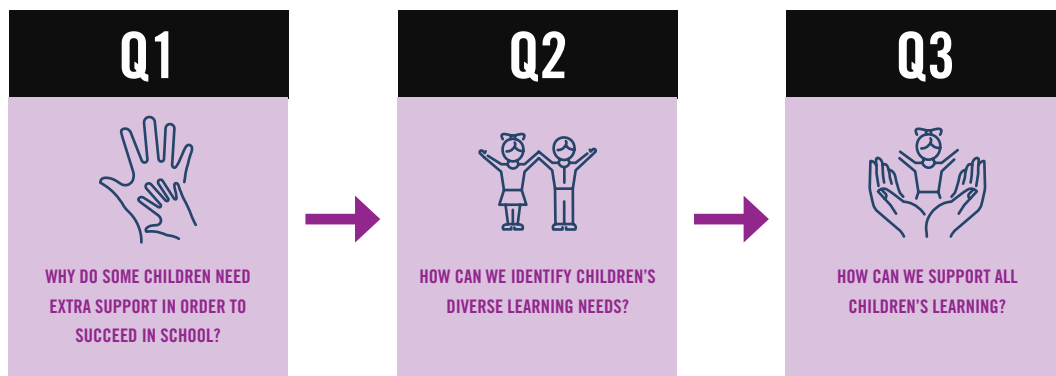
Figure 4.2. The Three Fundamental Questions to Guide Children's Learning

Early identification (or screening) of individuals who are at risk of poor education outcomes is required to identify learners who need additional support, and to subsequently provide the right instruction and intervention to improve life-long trajectories of human flourishing **(WG3-ch6)**. Currently, a "wait to fail" approach prevails, rather than preventive or proactive approaches. Recent research supports an early and targeted approach, for example, within IDEA **(2004)**, the Response to Intervention (RtI) model that consists of learner evaluation, instruction, and intervention phases in three tiers **(WG3-ch6)** and involves universal screening of all young students for early predictors of academic achievement.

KEY FINDING

4.7

<u>Design and implement EdTech tools and processes</u>

informed by ethical use of Artificial Intelligence (AI) that acknowledge and cater to individual differences, provide personalized learning experiences, and minimizes negative impacts of datafication and digitalization leading to more equitable and inclusive education for all.

> The use of EdTech needs to be carefully implemented to ensure its advantages are utilized and to minimize the negative impacts of datafication and digitalization.

The use of EdTech needs to be carefully implemented to ensure its advantages are utilized and to minimize the negative impacts of datafication and digitalization.

In any topic or domain, knowledge, skills, strategies, and disposition (KSSD) need to be learned, and each is likely to require one or more types of learning activity **(WG2-ch6)**. Learning technologies need to be aligned with KSSD and learners in the following ways:

INTERACTIVITY.
Systematically responds to the actions of the learner.

ADAPTIVITY.
Presents information contingent on the behavior, knowledge, or characteristics of the learner.

FEEDBACK.
Gives the learner feedback on the quality of their performance and how to improve.

CHOICE.
Gives learners options on what to learn and how to regulate their own learning.

NONLINEAR ACCESS.
Allows the learner to select or receive learning activities according to need.

LINKED REPRESENTATIONS.
Provides quick connections between topics, emphasizing different conceptual viewpoints, media, and pedagogical strategies.

COMMUNICATION WITH OTHER PEOPLE.
Learner's communication is mediated by technology with one or more people or agents.

OPEN-ENDED LEARNER INPUT.
The technology allows learners to express themselves through natural language, drawing pictures, and other forms of open-ended communication.
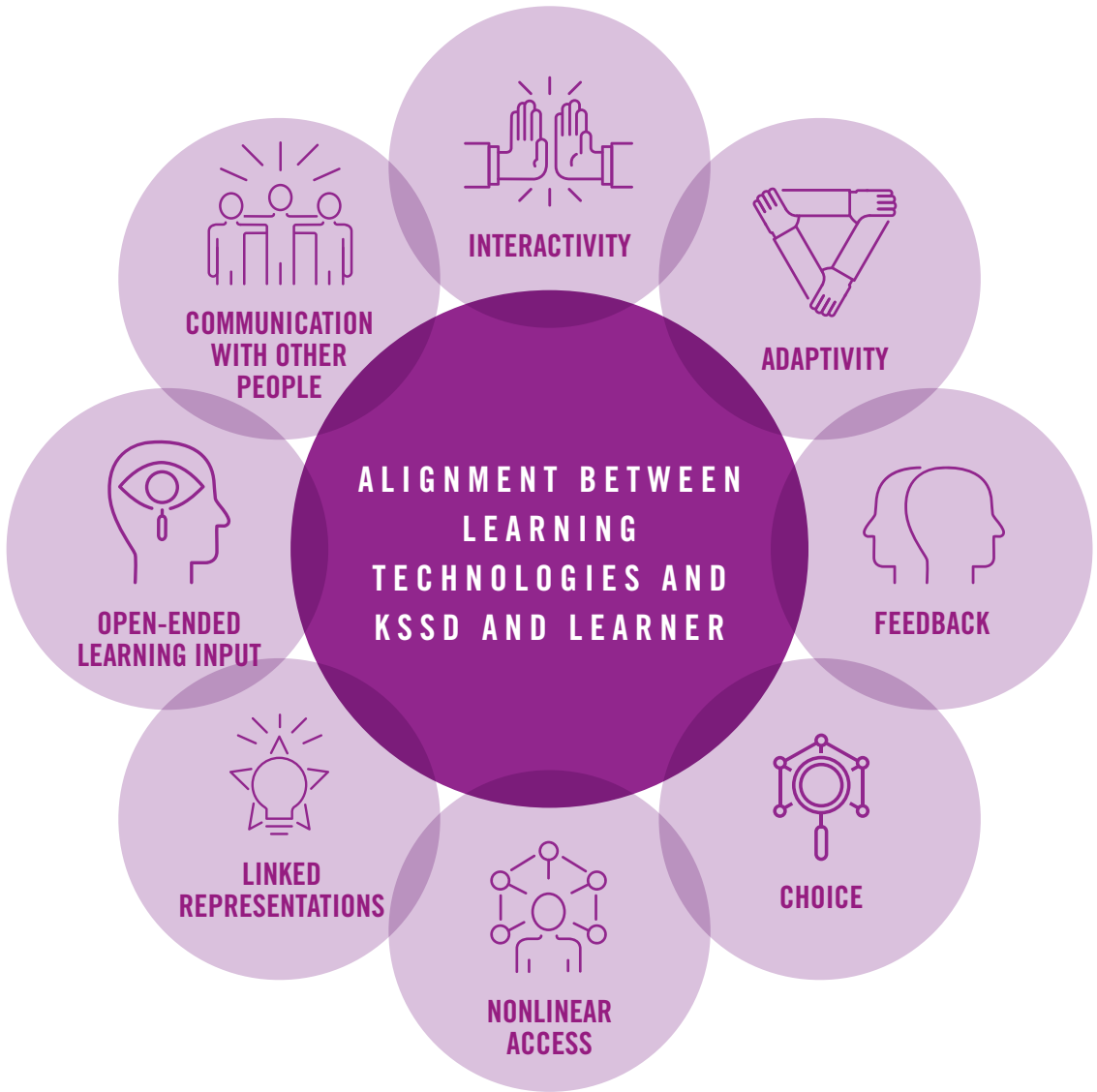
Figure 4.3. Alignment between learning technologies and KSSD (knowledge, skills, strategies, and disposition) and learner

Of the potential negative effects of EdTech **(see Key Finding 3.3),** one is the potential for datafication of teaching and learning **(WG3-ch7)**. Highly surveilled curriculum milieus may lead to unpredictable privacy risks, stunted social development, increased plagiarism, political passivity, and so on. Curriculum design and classroom teaching should allow for "psychological space" to play trial and error **(WG2-ch8)**. In other words, a careful balance between using EdTech and "tech-free"

4.8

Inculcate the key competencies

of information literacy to address information overload and misinformation.

Information literacy is essential in the face of information overload and to identify misinformation.

Information literacy is essential in the face of information overload and to identify misinformation. Investing in information literacy is important to prevent an important potential negative consequence of information technology developments, namely that of misinformation. **Figure**

4.3 summarizes the five key competencies needed for information literacy. Multiple source evaluation is a prerequisite to learning and understanding; information must be evaluated, cross-validated, and integrated **(WG2-ch6)**.

ABILITY TO DETERMINE THE NATURE AND EXTENT OF THE INFORMATION NEEDED

ABILITY TO EFFECTIVELY AND EFFICIENTLY ACCESS NEEDED INFORMATION

ABILITY TO EVALUATE INFORMATION AND ITS SOURCES CRITICALLY AND TO INCORPORATE THE INFORMATION INTO THE PERSONAL KNOWLEDGE BASE AND VALUE SYSTEM

ABILITY TO SUMMARISE AND SYNTHESISE THE MAIN IDEAS TO BE EXTRACTED FROM THE INFORMATION AND TO CONSTRUCT NEW CONCEPTS

ABILITY TO USE INFORMATION EFFECTIVELY TO ACCOMPLISH A SPECIFIC/ETHICAL PURPOSE

Figure 4.4. The Five Key Competencies for Information Literacy

KEY FINDING

4.9

Invest in teacher training for an education

for flourishing. Investments and reforms in teacher education can optimally guide learning for all students. In addition, they can increase teacher flourishing, which is important for learner flourishing.

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Important areas where teacher training needs more attention lies in how to teach/nurture social–emotional skills **(WG3-ch4)** and how to (not) use EdTech **(WG2-ch6)**. Moreover, it is important to empower teachers with the science of learning **(WG2-ch7; WG3-ch3)**. Incorporating neuroscience in teacher-training raises awareness of the wide variety of factors that affect the brain and helps in debunking neuromyths in education **(WG2-ch7)**. Educators and policy makers need to be aware of the basic principles of neuroscience to distinguish information and teaching methods based on scientific evidence vs. pseudoscience **(WG3-ch3)**.

A "critical approach" to teaching training urges teachers to reflect on their own experiences and understand systemic marginalization and the need for inclusive education. Teachers' education should include the understanding of contexts and how these can play a role in defining their agency, scope and their own learning. Teacher-training also needs to develop the competences, expertise, and tools that will meet the needs of students with (learning) disabilities/differences or difficulties to make inclusive education work **(WG2-ch4; WG3-ch6)**.
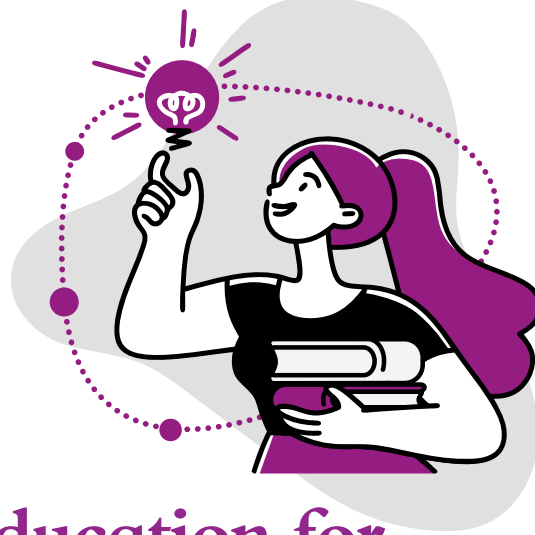
KEY FINDING

4.10

Education for flourishing needs to be informed

by insights from the learning sciences on optimal conditions for learning, effective learning strategies, and the negative effects of trauma, poverty, and stress.

Recent insights from the learning sciences increase understanding of optimal conditions for learning, effective learning strategies, and the negative effects of trauma, poverty, and stress. Education needs to be better informed by these insights to enhance students' learning and flourishing.

Recent insights from the learning sciences increase understanding of optimal conditions for learning, effective learning strategies, and the negative effects of trauma, poverty, and stress. Education needs to be better informed by these insights to enhance students' learning and flourishing.

Evidence of the impact of physiological circumstances for learning **(WG3-ch2)**, including sleep, nutrition, and physical exercise, is growing. Schools should incorporate this knowledge, for example, by providing pre- and post–training sleep, healthy school meals and regular exercise.

Understanding the biological scaffolding of memory consolidation informs which study techniques optimally enable learning **(WG3-ch2)**. Evidence shows that students benefit more from taking exams than from studying. Retrieval practice in the classroom relies on active resolution of questions, rather than passive incorporation of knowledge. Students should have the opportunity to practice content retrieval at least once for every content learned, since most learning benefits come from the first retrieval practice attempt. Multiple retrieval practices should be spaced rather than performed in blocks.

Schools should provide access to adequate psychological support to mitigate the profound negative effects of trauma, poverty, and stress on learning **(WG3-ch2)**.

KEY FINDING
4.11

Social influences reinforcing gender stereotypes

need to be minimized to promote gender equality.

There is no conclusive evidence that boys and girls show systematically different brain development or learning (WG3- ch2, ch5). Influences that reinforce gender stereotypes should be minimized to give boys and girls equal opportunities.

There is no conclusive evidence that boys and girls show systematically different brain development or learning (WG3- ch2, ch5). Influences that reinforce gender stereotypes should be minimized to give boys and girls equal opportunities.

Although inter-group differences between boys' and girls' brain anatomy or function have sometimes been found, large intra-group variation precludes any conclusions at the individual level. Furthermore, it is currently impossible in most anatomical, functional, and behavioral studies to disentangle biological sex differences from environmental and social influences **(WG3-ch2)**, making the sole influence of genetic factors difficult to assess. Therefore, approaches that reinforce gender stereotypes should be avoided, to give boys and girls equal learning opportunities.

KEY FINDING
4.12

Different ages come with different opportunities

and school curricula should be aligned accordingly. Both childhood and adolescence are heightened periods of brain plasticity, enabling efficient learning. Adolescence is a window of opportunity for learning, engagement, and shaping prosocial behavior, and continued investment must be made throughout all stages of learning.

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Both childhood and adolescence are heightened periods of brain plasticity, enabling efficient learning (WG3- ch2). Adolescence is a window of opportunity for learning, engagement, and shaping prosocial behavior. Different brain regions mature at different rates, resulting in different sensitive windows for different functions. These sensitive windows influence the learning of cognitive and social-emotional skills related to human flourishing. Education should better align with these windows. For example, increased activity of the reward-related brain circuit in adolescence has been linked to positive behaviors, such as prosocial behavior **(WG3-ch2)**, better learning from feedback **(WG3-ch2)**, and better learning in a risky context

(WG3-ch2). This has implications for improving motivational engagement for adolescents, and therefore for education practice. These different periods of heightened sensitivity are also important for the development of flourishing **(WG1-ch3)**. For example, we know that maternal stress during pregnancy is associated with low birth weight, which is linked to higher likelihood of mental health and behavioral problems in childhood. Infancy shapes life-long learning and relational tendencies, impacting on flourishing. Childhood is a particularly sensitive stage for development of self-regulation, and therefore autonomy, mastery, and relatedness. Self-regulation abilities predict risk behaviors and academic achievement in

adolescents as well as income, educational level obtained, and even levels of engagement in criminal activity in adults. Adolescents' increasing metacognitive ability to reflect on their thinking, emotions, behavior, and relationships expands the scope of self-regulatory skills toward more complex strategies involving planning, consideration of a range of information sources, others' perspectives, and wider societal issues, and one's longer-term goals.

Better understanding of these periods of sensitivity can guide development and implementation of effective school curricula in an effective and age-appropriate manner. Also, the influence of the wellbeing of adults, including teachers and parents, on young people, indicates that the flourishing of adults is inseparable from the flourishing of young people **(WG1- ch3)**.

KEY FINDING

4.13

Education policy and practice should engage with growing evidence on the benefits of varied environments for cognitive and social-emotional and behavioral learning outcomes (WG3- ch7).

Develop dynamic and adaptable learning spaces to

allow experiential, outdoor, community and place-based learning conducive to learners' flourishing and promote equity and inclusiveness.

Education policy and practice should engage with growing evidence on the benefits of varied environments for cognitive and social-emotional and behavioral learning outcomes **(WG3-ch7)**.

Education is often still taking place in classrooms that remain unchanged from those envisioned at the beginning of mass schooling. Reimagining learning spaces supports engagement. This includes not only accessible and sustainable school design, but also outdoor, community, place-, and land-based settings. Formal schooling needs to be connected to research on the importance of experiential and place-based learning.

WHICH GAPS SHOULD BE AD-DRESSED IN FU-

KEY QUESTION

O5

Which gaps should be addressed in future research?

KEY FINDING

5.1

Data, evidence and statistical significance

are key variables to be considered in educational policy-making. Effect sizes, internal validity and uncertainty in findings are key concepts to be included in any policy design.

> Whether an education intervention has practical and scientific significance should be discussed in terms of effect sizes, as well as information about internal validity of, and uncertainty in, the findings.

Whether an education intervention has practical and scientific significance should be discussed in terms of effect sizes, as well as information about internal validity of, and uncertainty in, the findings.

Policy decisions are often made on the basis of incomplete and imperfect information. Instead of relying on statistical significance, interpretation of findings should be based on effect sizes, accompanied by information about uncertainty to answer the questions "How well did the intervention work?" and "What effects can we expect from the intervention?". Simply testing "what works" is not enough to improve education for human flourishing. A higher minimum standard is needed for evidence of improved learning **(WG4-ch1)**. A complete inventory of available interventions, rank-ordered in terms of relative efficacy, will identify what works best generally and whether an intervention will work in a specific context **(WG4-ch1)**. Both meta-analyses and mega-analyses can support identification of intervention effectiveness. A realist review should complement meta-analyses **(WG4- ch1)**.

To ease interpretation for policy makers, such as teachers and school boards, effect sizes (i.e., a number that expresses how well an intervention works) might be transformed into practice-oriented measures that are easy to interpret, such as months of additional progress **(WG4- ch2)**.

KEY FINDING

5.2

Research must include diversity

when analysing student learning as drawing conclusions from homogenous groups can be misleading and lead to suboptimal learning outcomes.

Many specific student groups are excluded from mainstream educational research **(WG2-ch7; WG3-ch5, ch6).** Specific groups of students, such as children with disabilities/differences, institutionalized children, children with special educational needs, indigenous children, children from pastoral or nomadic communities, or children who are absent from mainstream schooling, are systematically excluded from data of large-scale surveys and studies, leading to their invisibility in monitoring and evaluation, and to their exclusion in evidence-based research informing policy reforms in education **(WG3- ch6).** Research that does focus on students with disabilities and learning difficulties mainly stems from the Global North, thus shaping policy and education practices for students with disabilities and learning difficulties in completely different cultural contexts. The ISEE Assessment underscores the risks of applying such knowledge

KEY FINDING

5.3

EdTech research must focus on ethics,

quality, inclusivity and equity and should include learners from varying social-economic-cultural backgrounds in research studies.

Research on the applicability of EdTech tools to cultural contexts other than the West is lacking.

Research on the applicability of EdTech tools to cultural contexts other than the West is lacking. Related to **Key Finding 5.2**, much of the development of emerging EdTech is being produced in Western higher education institutions and commercial centers **(WG2- ch6)**. Thus, research in understanding how EdTech is effectively deployed, adapted, aligned, or redesigned when introduced into other cultures, nations, and contexts is a critical need **(WG2- ch6)**. Additionally, research into the concept of digital pedagogy and the use of AI and related ethical issues, including data collection on students and teachers, will be beneficial for the development of personalized learning **(WG3, overarching finding)**.
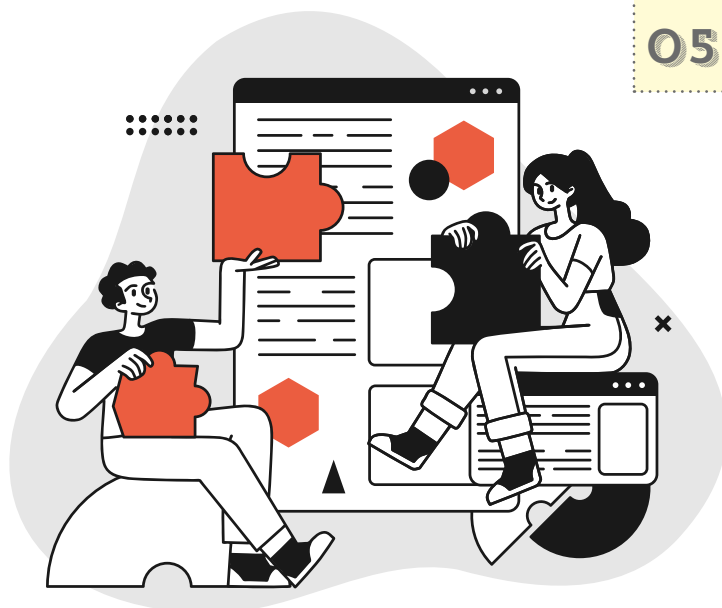
KEY FINDING

5.4

Transdisciplinary and practice–research collaboration

must be a necessary condition for education-related research to produce transdisciplinary outcomes.

> **Limited interactions across the various disciplines working on education is holding back the potential benefits of research.**

Limited interactions across the various disciplines working on education is holding back the potential benefits of research. Cross-disciplinary research can lead to innovation in education. For example, culturally sensitive conceptualizations and assessments of psychological processes acknowledge interactions between individuals' cognitive development and socio-political factors shaping their environments **(WG3- ch3)**.

Constructive dialogue and collaboration across disciplines and a range of stakeholders can translate findings from multidisciplinary studies into informed and improved education practices and policy **(WG2- ch7)**. This can help to avoid myths in, for example, "bio–determinism" that need to be avoided at any cost **(WG3- ch3)**.

Educational neuroscience research and findings need to be embedded within the broader societal contexts in which they take place **(WG2-ch7)** and focus on solutions at a policy level to bring about systemic changes. Science needs to meet practitioners' and education stakeholders' needs. Communication channels between research and practitioners need to be strengthened **(WG3, overarching finding)**.

POLICY RECOMMENDATIONS

The main recommendations that emerge from the key findings of the ISEE Assessment range from the international level to the local school level yet are interconnected. A policy intervention at the international level must be able to be implemented at a national and local level. Ensuring this interconnectedness is the overarching recommendation of the ISEE Assessment.

1

RE-ORGANIZE CURRICULA, PEDAGOGIES, AND LEARNING ASSESSMENTS TOWARD A WHOLE-BRAIN LEARNER-CENTRIC, SOCIALLY INCLUSIVE EDUCATION FOR HUMAN FLOURISHING THAT EMPHASIZES INTERCONNECTEDNESS INSTEAD OF ISOLATION BETWEEN COGNITION, METACOGNITION AND SOCIAL-EMOTIONAL LEARNING.

Learning is individually different – influenced by a complex combination of internal biological and external societal (contextual) and ecological variables. Learning and behavioral change for flourishing happens when the continuous, dynamic and interconnected interplay between cognitive and social-emotional functions is facilitated while acknowledging and responding to the prevailing contextual factors at play. This "whole-brain" and individualized perspective on learning can foster learning for human flourishing. We recommend reorganizing curricula toward relevance-based, hybrid learning ecologies, integrating SEL, implementing high-quality digital learning resources for personalized and inclusive learning, adapting resources to acknowledge local and global issues, designing learning spaces that synthesize the built environment, the digital world and the natural environment, and shifting to formative and dynamic learner assessment.

2

REPLACE CREDENTIALISM AND MERITOCRACY THAT PITS INDIVIDUALS AGAINST EACH OTHER WITH POTENTIALITY WHICH FOCUSES ON INVESTING IN SELF, AND EVALUATION OF SELF-GROWTH OVER TIME.

Move to a system focused on potentiality where the focus is on the rate of learning and the progress and potentials of each learner, that is, "be your own benchmark" **(WG2- ch3; WG3- ch3,ch6)**.

Replace credentialism and meritocracy that pits individuals against each other with potentiality which focuses on investing in self, and evaluation of self-growth over time.

3

IMPLEMENT THE SIX DOMAIN CURRICULA (ENVIRONMENT, CULTURE, SOCIETY, TECHNOLOGY, INTERPERSONAL, SELF) FOR A LEARNING EXPERIENCE TOWARDS HUMAN FLOURISHING.

To promote flourishing, it is recommended that curricula encompass the environment, culture, society, technology, the interpersonal, and self-education to foster the seven pillars of "Learning" - learning to know, learning to think, learning to be, learning to become, learning to do, learning to live together, learning to live with nature **(WG1- ch4, ch5; WG3-ch1).**

4

INVEST IN MOTHER-TONGUE INSTRUCTION IN EARLY CHILDHOOD EDUCATION TO MAXIMIZE THE POTENTIAL OF CHILDREN FROM DIVERSE BACKGROUNDS.

Invest in the use of mother tongue in the early years of learning and then introduce second language education at later stages to maximize attainment of literacy competency **(WG3- ch5)**.

5

INTRODUCE EARLY UNIVERSAL SCREENING, INTERVENTION, AND MONITORING TO DESIGN INCLUSIVE EDUCATION AND LEARNING.

Early screening for learning weaknesses and strengths can lead to early intervention at a time in a child's development when their brains are mostly plastic and struggle has not manifested as a norm **(WG3-ch3,ch6)**. However, screening is not enough: schools also need to be able to implement interventions effectively, efficiently and equitably **(WG3-ch6)**.

6

PROVIDE A GLOBAL DATABASE TO FACILITATE PERSONALIZED LEARNING EXPERIENCES FOR ALL LEARNERS ACROSS THE WORLD.

International organizations, private companies, and member states together must develop a global database for learners to access curricula, pedagogies, teacher-training tools, and learner assessments to facilitate a whole-brain learner-centric learning experience via AI that is open, transparent, and secure **(WG2-ch6, ch7, ch8; WG3-ch7).**

7

SUPPORT AND STRENGTHEN SCHOOL-COMMUNITY PARTNERSHIPS TO PROMOTE MORE LOCALIZED, PLACE-BASED CURRICULA TO LINK LEARNING TO REAL WORLD PROBLEMS LEARNERS FACE DAILY.

Local educational institutions become "centers of community" to facilitate sustainable development and engagement with potential causes of conflict, promote empathy, mutual understanding and justice, and develop innovative experiential learning models **(WG2- ch5, ch8)**. Support and strengthen school-community partnerships to promote more localised, place-based curricula to link learning to real world problems and the contextual factors learners face daily **(WG3-ch7).**

8

ENHANCE TEACHERS' FLOURISHING BY RECOGNIZING THE IMPORTANCE OF THE PROFESSION, BUILDING THEIR SOCIAL AND EMOTIONAL COMPETENCIES, INFORMATION LITERACY, AND INVESTMENT IN PRE- AND IN-SERVICE TEACHER TRAINING.

Teachers' flourishing should be enhanced by public recognition of teacher professionalism, adequate policies to protect teachers' status, promote competence-based teacher curricula and lifelong learning systems, promoting teachers' personal social and emotional learning, incorporating EdTech to support and strengthen teachers, promote teacher agency by involving them in reform-decisions, training and guidance in inclusive education, curricula, pedagogies, and learner assessment **(WG1- ch5; WG2-ch8, ch9; WG3- ch1,ch4, ch6)**.

9

INVOLVE PARENTS AS PARTNERS IN THE IMPLEMENTATION OF WHOLE-BRAIN LEARNER-CENTRIC EDUCATION.

Proactive partnerships and collaborations between teachers, parents, and learners can lead to positive outcomes in education **(WG2-ch5; WG3-ch6)**. Design activities which foster quality time interactions between parents and children to build their emotional resiliencies.

10

RE-ORGANIZE EDUCATION FUNDING TO ENSURE EQUITABLE AND INCLUSIVE WHOLE-BRAIN LEARNER-CENTRIC QUALITY EDUCATION FOR ALL LEARNERS AT ALL STAGES OF LEARNING.

Global funding might focus more on equity, inclusion, access to digital resources and technology, curriculum design rooted in local socio-cultural realities and with a whole-brain learner centered perspective, and development and implementation of formative assessment **(WG2-ch5, ch7; WG3).** Funding should acknowledge that investment in early childhood is key for human flourishing but must recognise that drop in funding in later years of schooling will lead to reduced returns towards human flourishing **(WG3-ch2).**

11

RE-ORGANIZE RESEARCH FUNDING TO ENABLE TRULY MULTIDISCIPLINARY, LARGE-SCALE, AND GLOBAL RESEARCH PROGRAMMES.

Funding for international multidisciplinary/ transdisciplinary research can lead to a better understanding of the inter-play of learning at the individual level and the role of context at the system level **(WG2-ch7).**

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Note: All titles are as of June 2021

UNESCO

Mahatma Gandhi Institute of
Education for Peace and
Sustainable Development

The **International Science and Evidence Based Education (ISEE)**
Assessment is an initiative of the UNESCO Mahatma Gandhi Institute of
Education for Peace and Sustainable Development (MGIEP), and is its contribution
to the Futures of Education process launched by UNESCO Paris in September
2019. In order to contribute to re-envisioning the future of education with a science
and evidence based report, UNESCO MGIEP embarked on the first-ever large-
scale assessment of knowledge of education.

The overall goal of the **ISEE Assessment** is to pool multi-disciplinary expertise
on educational systems and reforms from a range of stakeholders in an open and
inclusive manner, and to undertake a scientifically robust and evidence based
assessment that can inform education policy-making at all levels and on all scales.
Its aim is not to be policy prescriptive but to provide policy relevant information
and recommendations to improve education systems and the way we organize
learning in formal and non-formal settings. It is also meant to identify information
gaps and priorities for future research in the field of education.

In the education sector, the term assessment generally refers to activities used
to measure student progress. Going beyond this narrow notion of education
assessment, and drawing lessons from the IPCC Assessment Reports
and other scientific environmental assessments (such as the Millennium Ecosystem
Assessment and IPBES), UNESCO MGIEP aspires to initiate a scientifically
credible, legitimate, relevant and inclusive process that will assess the state of
education as a complex system and its role in achieving sustainable and peaceful
societies.

The ISEE Assessment uses the 1996 Delors Report's four pillars of education —
Learning to be, Learning to know, Learning to do and Learning to live together
as evaluative benchmarks and the lens of 'what', 'where', 'when' and 'how' we
learn and teach. The assessment is compiled by four Working Groups: (1) Human
Flourishing, Education and Learning; (2) Education, Learning and Context; (3)
Learning Experience; and (4) Data and Evidence.

4 QUALITY EDUCATION

Sustainable Development Goals