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Impact of the digitalization of education on the right to education

Report of the Special Rapporteur on the right to education, Koumbou Boly Barry

Summary

    In the present report, submitted pursuant to Human Rights Council resolutions 8/4 and 44/3, the Special Rapporteur on the right to education addresses the risks and opportunities of the digitalization of education and their impact on the right to education.

    The Special Rapporteur calls for discussions relating to the introduction of digital technologies in education to be framed around the right of every person to free, quality, public education and the commitments of States in this regard under both international human rights law and Sustainable Development Goal 4.

    In particular, the implementation of the right to education must respond to the needs of all persons to access, master and use technology as an empowering tool for being active members of society.

    The digitalization of education should be geared towards a better implementation of the right to education for all, where it is demonstrated that it brings a significant added value. In this regard, it is important to understand the profit-driven agenda of digital technology lobbyists and companies. In addition, the digitalization of education should not increase inequalities and benefit already privileged segments of societies only or lead to violations of other human rights within education, in particular the right to privacy.

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I. Introduction

1. In the present report, the Special Rapporteur on the right to education addresses the risks and opportunities of the digitalization of education and their impact on the right to education. She follows up on her recommendation, in the midst of the coronavirus disease (COVID-19) pandemic, that serious thought should be given to the place and content of digital education, its meaning and efficiency, and its impact on the health and education of children and other learners.[1] She also pursues the work undertaken by a previous mandate holder, who released in 2016 a report on the right to education in the digital age, focusing on higher education, and whose recommendations remain relevant.[2]

2. In the past two years, as a result of the pandemic, digital education has tremendously gained in importance, demonstrating its significant added value in emergency situations, but also its limits compared to face-to-face education in institutions conceived as safe spaces where members of the educational community, in particular teachers and learners, interact and where various social services are provided to families and communities.

3. Digital technology was already fast growing in education before the pandemic, in the form of smartphones; laptop, tablet and desktop computers; projectors; interactive whiteboards; intelligent systems and robots; platforms; applications; games; and virtual reality; as well as in the use of data mining and algorithms for educational purposes. It is now embedded in contemporary societies and its omnipresence in all spheres of education seems inevitable. Key trends include blended approaches, which combine face-to-face methods with computer-mediated activities; distance learning, which has historically targeted non-traditional students, such as full-time workers and residents of remote areas or learning in a context of emergency; artificial intelligence systems, designed to operate with varying levels of autonomy to identify learning patterns and suggest activities in a given curriculum; gamification, understood as the use of game-design elements for education; and learning analytics, a recent area of work exploring how data mining, machine learning, visualization and human-computer interaction, among others, can provide insights for educators and learners to improve teaching and learning.

4. The digitalization of education opens up new policy choices for Governments. In the context of limited budgets and austerity measures, one of the greatest challenges seems to be finding the balance between investment in the human factor, namely teachers and in-person schooling, and investment in digital technologies. This is a false alternative, however, as digitalizing education must be accompanied by significant investment in the human factor, most particularly teachers, who remain key to the implementation of the right to education. Underlying questions must also be addressed, such as what exactly is more expensive, including in the long term, who bears the costs of digital technologies in education (including children and their families through, for example, the mining of their data and the constant violation of their right to privacy) and which objectives are pursued (simply using machines for the purpose of education or allowing a true digital education for future digital citizens).

5. As debates around the digitalization of education tend to focus on the effectiveness of methods, tools and strategies – often in search of evidence-based solutions of "what works" – it is important to emphasize the lack of evidence and contextualized evaluation supporting the claimed added value of digital technologies in many respects. Decision makers at all levels must understand the profit-driven agenda of digital technology lobbyists and companies, who push them into introducing digital technologies rapidly in schools, and how this can negatively affect education systems for the benefit of a few.

6. The Special Rapporteur calls for the discussion to be framed around the right of every person to free, quality, public education and the commitments of States in this regard, both under international human rights law and Sustainable Development Goal 4. Great opportunities are opened and novel approaches are introduced through the digitalization of education, but under certain conditions only. While it would be unfair to highlight only the problems, stakeholders must keep in mind that technology that is not regulated according to

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[1] A/HRC/44/39, para. 84 (h).
[2] A/HRC/32/37.

international human rights principles can lead to harmful dynamics. Believing that digital technology will trigger a fundamental transformation of education systems and solve all problems is expecting too much from technology, [3] which needs active and intentional steering to produce positive changes for a better implementation of the right to education.

7. Under international human rights law, a number of important provisions must be respected and implemented, relating to, inter alia, States' obligation to allocate the maximum of their available resources towards ensuring free, quality education, the rights to non-discrimination and equality, the prohibition of retrogressive measures, and the requirement that limitations on human rights must be legal and proportionate to a legitimate aim. Human rights within the education sphere, such as the right to privacy, must be respected.

8. For the present report, the Special Rapporteur benefited from the support of the Network for International Policies and Cooperation in Education and Training at the Graduate Institute of International and Development Studies, which helped her to organize six online experts' meetings to discuss various aspects of the impact of the digitalization of education on the right to education. Experts from various backgrounds and parts of the world, including from the United Nations Educational, Scientific and Cultural Organization (UNESCO), participated in the meetings. The Special Rapporteur warmly thanks all the experts and partners and her team at the Office of the United Nations High Commissioner for Human Rights, as well as civil society actors, who submitted spontaneous contributions for their support.[4]

II. Legal framework and guidelines

A. Relevant human rights provisions and commitments

9. The legal instruments relevant to the right to education remain fully applicable to digital education. Of particular relevance are article 26 of the Universal Declaration of Human Rights, articles 13 and 14 of the International Covenant on Economic, Social and Cultural Rights, articles 28 and 29 of the Convention on the Rights of the Child, and the Convention against Discrimination in Education of UNESCO. States must allocate the maximum of their available resources towards ensuring free, quality education, which must be continuously improved, and prioritize the right to free, quality, public education.[5]

10. The purposes and aims of education must be maintained at all levels, as established by the instruments referred to above. As recalled many times by the Special Rapporteur, education should be directed at the full development of the human personality and a sense of dignity and it should strengthen respect for human rights. Education should enable all persons to participate effectively in a free society, promote understanding, tolerance and friendship among all nations and ethnic or religious groups, and further the activities of the United Nations for the maintenance of peace. Peace, acceptance, the participation of all in the development of society, knowing and understanding the "other", respect for cultural diversity and an education that is adequate for, and adapted to the specific needs of, people in their own context are objectives of education that have been widely recognized by States and human rights mechanisms at the international and regional levels. Therefore, the digitalization of education should further not only skills, abilities and competencies, but also the development of the human personality, effective participation in a free society and societies' capacities to decide on their own development.

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[3] J. Reich, *Failure to Disrupt: Why Technology Alone Can't Transform Education* (Harvard University Press, 2020). See also United Nations Educational, Scientific and Cultural Organization (UNESCO), *An Ed-Tech Tragedy: Education and Technology Solutionism in the Time of COVID-19* (forthcoming).

[4] The list of contributing experts and voluntary contributions will be available at https://www.ohchr.org/en/special-procedures/sr-education.

[5] International Covenant on Economic, Social and Cultural Rights, art. 2; and Abidjan Principles on the human rights obligations of States to provide public education and to regulate private involvement in education, para. 17.

11.   These legal provisions must be read in conjunction with the principles of non-discrimination and equality. As expressed in most international instruments, human rights must be exercised without discrimination of any kind based on race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. In 2015, States committed, under Sustainable Development Goal 4, to ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all by 2030.

12.   States must ensure that their laws, policies and practices do not directly or indirectly discriminate in education and they must address any situation breaching the rights to equality and non-discrimination, whether or not such situation results from their acts.[6] Therefore, they have the obligation to pay serious attention to the indirect discriminatory effects of the digitalization of education. Digitalization, under international law, cannot be introduced or enhanced without a plan on how to address and prevent such consequences.

13.   Under article 27 of the Universal Declaration of Human Rights and article 15 of the International Covenant on Economic, Social and Cultural Rights, everyone has the right to share in scientific advancement and its benefits. As mentioned by the Special Rapporteur in the field of cultural rights, States should take measures to enhance access to computers and Internet connectivity, including through appropriate Internet governance that supports the right of everyone to have access to and use information and communications technology in self-determined and empowering ways, and they should consider establishing universal services, including electricity and telephone and computer/Internet connections, to ensure access of all to these essential technologies.[7]

14.   In the same spirit, for the International Commission on the Futures of Education, convened by the Director General of UNESCO, digital literacy and access should be considered as basic rights in the twenty-first century.[8] The Commission has highlighted the need to broaden the understanding of the right to education to include digital competencies and access as a means of supporting the right to education, the right to information and cultural rights.[9] As stated in the Rewired Global Declaration on Connectivity for Education of 2021: "Connectivity initiatives should be guided by an ethic of inclusion and begin with those facing disadvantage."[10]

15.   Other human rights, including the rights of the child, must also be upheld in the context of the digitalization of education. Special attention should be paid to the right to freedom of opinion and expression, including the right to seek, receive and impart information and ideas of all kinds, regardless of frontiers, as expressed in article 19 of the International Covenant on Civil and Political Rights and article 13 of the Convention on the Rights of the Child.

16.   Article 17 of the Convention on the Rights of the Child further affirms that children must have access to information and material from a diversity of national and international sources. States are to adopt appropriate guidelines for the protection of the child from information and material injurious to his or her well-being (art. 17) and ensure the protection of the child from all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation, including sexual abuse (art. 19).

17.   All persons, including those within the realm of education, are entitled to the right to privacy (International Covenant on Civil and Political Rights, art. 17) and, in accordance with article 16 of the Convention on the Rights of the Child, no child is to be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence, or to unlawful attacks on his or her honour and reputation. In its general comment No. 25 (2021),

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[6] Abidjan Principles, para. 25.

[7] A/HRC/20/26, paras. 74 (c) and (e). See also Committee on Economic, Social and Cultural Rights, general comment No. 25 (2020), para. 45.

[8] UNESCO, *Reimagining Our Futures Together: a New Social Contract for Education – Report from the International Commission on the Futures of Education* (2021), p. 34.

[9] Ibid., p. 34.

[10] See https://unesdoc.unesco.org/ark:/48223/pf0000380598/PDF/380598eng.pdf.multi.

the Committee on the Rights of the Child underlined that children had a right to privacy in the digital space, which was vital for protecting their agency, dignity and safety.[11]

18.   Recent guidance, such as the recommendation on the ethics of artificial intelligence, adopted by the General Conference of UNESCO in 2021, have also been adopted to specifically address the human rights issues posed by these new technologies.

19.   The digitalization of education is closely related to the engagement of private actors, in particular technology companies. The Special Rapporteur recalls her recommendation to use the Abidjan Principles on the human rights obligations of States to provide public education and to regulate private involvement in education as a guiding tool in this respect. The right to education requires States to deliver free, quality, public education. States retain their obligations to respect, protect and fulfil the right to education where private actors are involved in education and are required to regulate private involvement in education. They must ensure that private education conforms to educational standards, that its existence does not jeopardize the role of the State as educational guarantor, that it is not exploited to increase inequality or injustice, and that the recipients of private education are its principal beneficiaries.[12] These obligations apply in relation not only to private education institutions, but also where partnerships are developed between public education systems and private actors, in particular for the design and implementation of digital education.

20.   As established in the Guiding Principles on Business and Human Rights, States have the duty to protect against human rights abuses by all actors in society, including businesses. This means that States must prevent, investigate, punish and redress human rights abuses that take place in domestic business operations. In the Guiding Principles, it is recommended that States set clear expectations that companies domiciled in their territory or jurisdiction respect human rights in every country and context in which they operate. Business enterprises must prevent, mitigate and, where appropriate, remedy human rights abuses that they cause or to which they contribute. These principles apply to all States and business enterprises, transnational and others, regardless of their size, sector, location, ownership or structure.

21.   Lastly, the Special Rapporteur underlines the important obligation of States under article 28 (3) of the Convention on the Rights of the Child to promote and encourage international cooperation in matters relating to education, in particular with a view to contributing to the elimination of ignorance and illiteracy throughout the world and facilitating access to scientific and technical knowledge and modern teaching methods. In this regard, particular account is to be taken of the needs of developing countries.

B.   "4 As" framework of availability, accessibility, acceptability and adaptability

22.   Education must address the essential features of availability, accessibility, acceptability and adaptability, as established by the Committee on Economic, Social and Cultural Rights and the Special Rapporteur on the right to education.[13] The introduction of digital education may enhance these features or jeopardize them, depending on the context and policy measures accompanying that process.

23.   Under the condition of availability, functioning educational institutions and programmes must be available in sufficient quantity. This includes, where appropriate, computer facilities and information technology, as well as sufficient numbers of teaching and other staff with the skills, qualifications and training necessary to engage in digital education. Availability also refers to the maintenance and repair of digital technologies, whose life cycles must be considered in terms of the communities who will ultimately have to carry out the maintenance and repair work.

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[11] Section E.

[12] A/HRC/41/37, paras. 76–77 and 80.

[13] Committee on Economic, Social and Cultural Rights, general comment No. 13 (1999), para. 6; and A/HRC/44/39, para. 14. See also paragraph 14 of the Abidjan Principles.

24. Conversely, digital technology should not be used as a justification for the unavailability of schools or campuses for all learners. Digital technologies should be aimed at supporting – and not replacing – schools and teachers.[14]

25. **Accessibility** includes physical, economic and information accessibility to educational institutions and programmes for everyone, without discrimination. Technology can support accessibility by ensuring that all students have access to education through modern technology, including those who have limited physical access for any reason.

26. However, the digital element may become an impediment to accessibility for those students, families and teachers who do not have sufficient financial means or who reside in geographical locations not, or poorly, connected to the Internet. A lack of digital skills of students and families can cause new forms of exclusion and negatively affect families' access to information about school life and the development of constructive relationships with teachers.

27. In 2015, States committed to ensuring the provision of 12 years of free, publicly funded, equitable, quality primary and secondary education.[15] This implies eliminating not only direct costs, such as fees, but also hidden costs, such as those for books, uniforms and transportation, and for laptop computers, cell phones and Internet access for online education. The costs related to the introduction of digital education can also have a considerable impact on students at higher levels of education, where the progressive introduction of free education remains a requirement under article 13 of the International Covenant on Economic, Social and Cultural Rights, and where the non-discrimination principle based on economic status continues to apply.

28. Internet shutdowns also often have a severe impact on the right to education, impeding learners in accessing online education, taking online exams or applying online for scholarships.[16]

29. **Acceptability** means that the form and substance of education, including curricula and teaching methods, must be acceptable (for example, relevant, culturally appropriate and of good quality) to students and, in appropriate cases, parents. They must be directed towards the objectives guaranteed under international human rights law. The curriculum should be human rights compliant, including being free from stereotypes.

30. In a recent report, the Special Rapporteur noted that the limited cultural relevance of education systems seriously impeded the realization of the right to education. Several factors should be put in place that are conducive to ensuring respect for diversity and the cultural rights of everyone in education, including making the most of cultural resources; participation in educational life of all relevant actors, including learners in all their diversity; decentralization in favour of local actors and the granting of a degree of autonomy for schools and teachers to ensure the cultural relevance of their teaching; participatory and holistic observation methods; and respect for freedoms in the field of education.[17] When digitalizing education, these principles must be upheld. The use of technology cannot depend on top-down approaches that exclude and silence local stakeholders, in particular teachers. It should be subject to evaluation regarding its relevance, cultural appropriateness and quality.

31. States must guarantee the highest attainable quality of education and design quality standards for education technology products and methodologies as they do for traditional courses and programmes.

32. Acceptability also entails having discussions about other possible effects of the digitalization of education, such as student isolation and health, students' development, respect for the right to privacy of students and data protection (see section IV below). A full discussion needs to take place on the age-appropriateness for the introduction of digital

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[14] UNESCO, *Reimagining Our Futures Together,* p. 101.

[15] Target 4.1 of the Sustainable Development Goals; and Incheon Declaration: Education 2030 – towards inclusive and equitable quality education and lifelong learning for all, para. 6.

[16] See, for example, TJK 1/2022.

[17] A/HRC/47/32, summary and para. 2.

technologies in schools, as well as on necessary prerequisites in terms of children's capacities and skills before fully developing their digital competencies.[18]

33.   **Adaptability** requires that education be flexible so it can adapt to the needs of changing societies and communities and respond to the needs of students within their diverse social and cultural settings. Digital technology can be useful in supporting the adaptability of education, making it flexible to adapt to the needs of changing societies and respond to students' needs, as well as situations of emergency.

34.   However, deliberate action, with appropriate training and financing, and school autonomy and flexibility for teachers to master and configure the technology in their own way are necessary to ensure adaptability.

III.   Identifying and enhancing the benefits of digital technology for the right to education

35.   The potential benefits of digital technology for the right to education are great, such as improving access and quality, implementing inclusive learning methodologies, augmenting students' learning experiences, developing virtual service-learning projects through which students from various countries interact, [19] and opening lifelong learning opportunities for all through both formal and non-formal education. However, they are not guaranteed in any simple and direct way and depend on the context and policies deployed. The Special Rapporteur reviews below what she considers the most important elements.

A.   Digital citizenship: participation and autonomy in a digital world

36.   In today's increasingly digital world, what counts from a right to education perspective is not so much the introduction of machines and programmes to "deliver" education, but the pursuit of comprehensive digital education to empower people with the digital competencies to actively and freely participate in all dimensions of human life (civil, cultural, economic, political and social) and to become active citizens.

37.   Thus, the right to education must include digital agency as a goal, understood as the ability to control and adapt to a digital world with digital competence, digital confidence and digital accountability.[20]

38.   In the view of the Special Rapporteur, digital agency includes overlapping notions, such as digital literacy (allowing people to function in a digital society and use digital technologies according to their specific context), media literacy in the digital world (empowering people to access, use and create content through digital platforms) and data literacy (the capacity to analyse and interpret data), as well as digital citizenship. UNESCO has defined digital citizenship as "being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, while being aware of one's own rights".[21]

39.   Importantly, other definitions add that "a digital citizen is able to understand the principles that govern the digital environment, to analyse the place of technologies in society, their impact on our daily lives, their role in building knowledge and their uses for social participation. A digital citizen is able to navigate the complex digital context, understand the

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[18] See the contribution from the European Council for Steiner Waldorf Education; and Matthew Jenkin, "Tablets out, imagination in: the schools that shun technology", *The Guardian,* 2 December 2015.

[19] See the contribution from New Humanity for a United World.

[20] Don Passey and others, "Digital agency: empowering equity in and through education", *Technology, Knowledge and Learning,* vol. 23, No. 3 (August 2018), pp. 425–439.

[21] UNESCO Bangkok, *A Policy Review: Building Digital Citizenship in Asia-Pacific through Safe, Effective and Responsible Use of ICT* (Paris, UNESCO, 2016), p. 15.

social, economic, political, and educational implications,"[22] and practice good stewardship of technology. Awareness and understanding of artificial intelligence technologies and the value of data should also be promoted through education and training.[23]

B. Personalized teaching and learning

40.   Personalizing education to students' needs and interests, which can improve learning outcomes and experiences, including of marginalized groups, did not start with the digitalization of education. However, technological developments have renewed attention on this topic.

41.   Personalization through technology is especially appealing in the cases of large groups, in which diversity is likely to be large and teachers face challenges in addressing all needs. Blended learning (with personalized learning) has gained particular attention in developing contexts. It is seen as a way to address the scarcity of trained teachers, to free up teachers' time for more complex tasks (transforming them into "facilitators") and to close educational gaps with personalized remedial instruction. Personalized learning can also be part of an effort to make education more inclusive, addressing the needs of all students, including those with disabilities and in the context of multilingual populations.

42.   The Special Rapporteur underlines, however, that more studies are needed to corroborate if and how personalization with technology can be used effectively to ensure the right to education, particularly in low- and middle-income countries, to verify its cost-effectiveness and to determine how it can be used in the classroom.[24] Companies have been marketing applications and games as tools for personalizing education, with little evidence of their efficacy.

43.   In addition, personalized learning through technology should not be used as an excuse to underfinance education and justify the unavailability of trained teachers. While more personalized teaching and learning has pedagogical value, it risks downplaying the common-good dimension of education and its collective aims as a societal endeavor. Lastly, individualization should not be conducive to some forms of segregation within classrooms, particularly of children with disabilities.

C. Digital solutions for crises: conflicts, epidemics and natural disasters

44.   Emergencies can cause severe disruptions to educational services. Digital technology, among other distance learning tools, can offer useful and important ways of ensuring the continuity of education.

45.   Remote education in a context of emergency is fundamentally different from a typical use of technology. On such occasions, teachers, educators and policymakers have little or no time to adjust. Thus, its implementation is reliant on knowledge and skills that teachers might not possess. This is why States should develop emergency education preparedness plans within national education systems, based on the right to education for all.[25]

46.   Despite some studies having shown potential benefits, digital technology does not necessarily represent the best cost-benefit or sustainable approach in all situations. Digital technology must supplement and not substitute teaching, and teacher mediation remains key to produce learner engagement. In this context, teachers' perception of technology and the availability of professional development are central for the successful use of digital

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[22] Roxana Morduchowicz, *Digital Citizenship as a Public Policy in Education in Latin America* (Paris, UNESCO, Montevideo, 2020).

[23] UNESCO, recommendation on the ethics of artificial intelligence, paras. 44–45.

[24] Louis Major, Gill A. Francis and Maria Tsapali (2021), "The effectiveness of technology-supported personalised learning in low- and middle-income countries: a meta-analysis", *British Journal of Educational Technology* (May 2021).

[25] A/HRC/44/39, para. 84 (c).

technology in emergency situations. Parents' perceptions are also relevant and are embedded in cultural dispositions, which must be taken into consideration in technology interventions.[26]

D. Gathering data to enhance the implementation of the right to education

47. The current digitalized datafication of education is connected to a long history of data use for educational management. Producing measurable, comparable education data across countries enables the construction of a certain universality of education policy problems and a collaborative spirit in finding solutions.[27]

48. The datafication of education happens at levels of education systems, schools, classrooms, teachers and students. The vastness of the data collected with the potential of data analytics can help to provide an understanding of how to improve learning, for example, how to improve the retention and consolidation of information, how to better space or order content, the ideal ages to introduce concepts, how to better shape the learning environment, and how attention, self-regulation and motivation work in a digital environment. The social context can also be explored through the use of digital technologies, such as classroom management, and student-teacher and peer social interactions.

49. When data are open and made available for all stakeholders, including teachers, students, parents, civil society and citizens in general, to monitor and improve the implementation of the right to education, there is the potential to change how education governance is executed, towards what has been termed "open government". The latter is based on principles of transparency, integrity, accountability and stakeholder participation. Data can be made accessible in the areas of teachers' availability; student-teacher ratios; school infrastructure; population profiles by areas and schools; ancillary services, such as school transport and meals; and even the outsourcing of services and their costs. The full protection of data and of the rights to privacy of students and education professionals must, however, always be ensured.

IV. Identifying and preventing negative impacts of digital technology on the right to education

50. The digitalization of education also brings serious risks to human rights, including the right to education. Some risks are the exact opposite of potential benefits: heightened exclusion instead of improved access, standardization instead of personalized teaching, enhanced stereotypes instead of diversity, reduced autonomy and freedom instead of creativity and participation, and data mining for the benefits of a few at odds with the public interest. Attacks on freedom of opinion and expression and on the right to privacy, advertising and marketing in schools, and an even greater commercialization of education also constitute great dangers for the right to quality education for all.

51. In practice, this means that the advantages of the digitalization of education will be – and already are – for the benefit of privileged segments of societies, those that already benefit from good quality education, good Internet connections, and hard- and software tailored to their needs and capacities, with trained teachers able to accompany them in the process of personalized teaching for a comprehensive digital education. Those who master technology now are the elites of tomorrow. For the numerous others, digital education may well become a cheap solution to "deliver" education without too much investment and just the minimum knowledge necessary to operate professionally without expressing creativity and without truly participating in society. Moreover, in many cases, the beneficiaries of the digitalization of education may well be businesses, not students or society.

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[26] Michaelle Tauson and Luke Stannard, *EdTech for Learning in Emergencies and Displaced Settings: a Rigorous Review and Narrative Synthesis* (Save the Children UK, 2018).

[27] Sotiria Grek, Christian Maroy and Antoni Verger, "Introduction: accountability and datafication in education – historical, transnational and conceptual perspectives", in *World Yearbook of Education 2021,* Sotiria Grek, Christian Maroy and Antoni Verger, eds. (Routledge, 2021), pp. 1–22.

A. Rising inequalities

52. Technology companies have offered themselves as the solution to improved access and support for those "most in need". However, there is little evidence that they effectively serve hard-to-reach communities.[28] One of the biggest challenges caused by the digitalization of education remains equality and inclusiveness.

53. The COVID-19 pandemic has demonstrated how reliance on digital education, in particular distance digital education, may exacerbate previously existing inequalities.[29] Students have unequal access to the Internet, adequate hardware and qualified teachers with digital skills, and teachers have varying levels of proficiency in the use of digital technology. The numbers are well known: almost half of the world's population, with the majority of them women in developing countries, are still not online.[30] In rich countries, inequalities are also a matter of concern. For instance, it is reported that, in the United States of America, 15 million to 16 million children, about 25 per cent of students, lack an adequate Internet connection.[31]

54. Introducing a framework for digitalizing education requires acknowledging those at the margins in order to ensure that programmes are designed in a way that reaches them and responds to their needs. Many factors, such as gender, ethnicity, religion, social class, rural versus urban location and disability, may affect how students and teachers experience digitalization and therefore the many ways in which technology may widen rather than reduce digital inequalities. Technology itself is embedded with an inherent bias that needs to be addressed.

55. States have put in place programmes to address some of these issues, before and since the pandemic. For example, Plan Ceibal, which began in 2007 in Uruguay, promotes social inclusion and equality to bridge the digital divide in the country and provides beneficiaries with the technology and tools necessary to use it effectively.[32]

B. Growing involvement of commercial actors in education

56. The digitalization of education is embedded in the context of the growing global involvement of commercial actors in education. This is to such an extent that, for some observers, the digitalization and marketization of education cannot be separated.[33] The involvement of commercial actors is accompanied by the "unbundling" of schools, or treating each piece of schooling as a marketable service. This practice revolves around offering children and young people a series of services instead of a single "package of education", in theory to allow for customization.[34] For instance, technology companies can create and sell digital teaching materials, educational platforms, applications for communication, short and long online courses, games and online tests, among others, not only to schools but also to students and parents. During the pandemic, they experienced explosive growth in demand and new users, with a huge surge in profit making, thanks in part to international

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[28] B. Williamson, R. Eynon and J. Potter, "Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency", *Learning, Media and Technology,* vol. 45, No. 2 (May 2020), pp. 107–114; and F. Macgilchrist, "Cruel optimism in edtech: when the digital data practices of educational technology providers inadvertently hinder educational equity", *Learning, Media and Technology*, vol. 44, No. 1 (2019), pp. 77–86.

[29] See A/HRC/44/39. See also the contribution from Humanity and Inclusion.

[30] See https://www.un.org/press/en/2021/dsgsm1579.doc.htm.

[31] See https://www.commonsensemedia.org/about-us/news/press-releases/k-12-student-digital-divide-much-larger-than-previously-estimated-and.

[32] UNESCO, *Enhancing Social Inclusion through Innovative Mobile Learning in Uruguay: Case Study by the UNESCO-Fazheng Project on Best Practices in Mobile Learning* (Paris, 2018).

[33] B. Williamson, "The hidden architecture of higher education: building a big data infrastructure for the 'smarter university'", *International Journal of Educational Technology in Higher Education*, vol. 15, No. 12 (March 2018); and J. Komljenovic, "The future of value in digitalised higher education: why data privacy should not be our biggest concern", *Higher Education*, vol. 83, No. 3 (January 2022), pp. 1–17.

[34] See https://www.aei.org/research-products/report/from-school-choice-to-educational-choice/.

organizations and Governments rapidly signing agreements with them and recommending their products.[35]

57.   The Special Rapporteur regrets that education is perceived by some as a market with great potential for profit. Some companies are global businesses without interests in or a deep understanding of the contexts in which they operate. They do not seek to promote the interests of learners, but to maximize profit. The Special Rapporteur recalls her report devoted to this issue[36] and the useful guidance provided by the Abidjan Principles in this respect.

58.   Education technology companies have been striving to grow as decisive stakeholders in the sector, embedding private logics and actors in public institutions and decision-making spaces.[37] Public education is likely to be increasingly pressured by private agendas and influences by global corporations and wealthy philanthropists that aim to find ways of combining education and profit.[38]

59.   The use of privately provided services and platforms also creates a harmful dependency of Governments in relation to private companies. Private organizations now offer platforms, servers, tools and services at no cost or low cost. In the longer term – sometimes not so long – services become costlier. Governments end up not developing their own tools, giving control over data, decisions, privacy and autonomy.

60.   This is particularly problematic for countries in the global South, where public education can become subordinated to corporate providers. With corporations mostly located in the global North, the issue of education privatization through digitalization also concerns global power dynamics, which can exacerbate existing international inequalities. Representatives from the global South are missing from the discussion and development of digital solutions for education and are not represented in spaces of decision-making.

61.   All of these issues lack appropriate international and national regulation. Public policies have not been able to keep up with the changes in digital education and thus have not been able to ensure transparency and participation in this arena. Private organizations must be held accountable for their digital work, and the public must be able to actively participate in and supervise the developments of digital education.

C. Datafication and surveillance

62.   Digital technologies in education generate large amounts of data about students and teachers, which are expected to grow dramatically. The massive imbalance in power, awareness and knowledge between those who decide on the technologies and the users is striking, at odds with the human rights principles of freedom, equality, autonomy and participation. As data are often proprietary and not open to oversight and reuse by educators, they are often not used or useful for schools.

63.   How data are collected and used is far from transparent, with, in some cases, total opacity and disrespect for the right to privacy and the principle of meaningful consent. The Special Rapporteur welcomes in this respect civil society initiatives aimed at disseminating information about these issues, such as "Educação Vigiada" (education under surveillance) in South America.

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[35] See https://www.ei-ie.org/en/item/23425:edtech-pandemic-shock-new-ei-research-launched-on-covid-19-education-commercialisation.

[36] A/HRC/41/37.

[37] S.J. Ball, C. Junemann and D. Santori, *Edu.net: Globalisation and Education Policy Mobility* (London, Taylor and Francis, 2017); A. Verger, C. Fontdevila and A. Zancajo, "Multiple paths towards education privatization in a globalizing world: a cultural political economy review", *Journal of Education Policy*, vol. 32, No. 6 (April 2017), pp. 757–787; B. Williamson, "Policy networks, performance metrics and platform markets: charting the expanding data infrastructure of higher education", *British Journal of Educational Technology,* vol. 50, No. 6 (November 2019), pp. 2794–2809; and B. Williamson, "Making markets through digital platforms: Pearson, edu-business, and the (e)valuation of higher education", *Critical Studies in Education* (March 2020), pp. 50–66.

[38] N. Selwyn and others (2020). "What might the school of 2030 be like? An exercise in social science fiction", *Learning, Media and Technology,* vol. 45, No. 1 (2020), pp. 1–17.

64.   School administrators and educators often remain unaware of how data are used by third parties, and lines of accountability for data-based decision-making are often unclear. The scope of data collected is enormous, including students and teachers' user information, identification, biometric data, calendars, contacts, photos, Internet Protocol addresses and local storage, but also learning trajectories, engagement scores, response times, pages read and videos viewed. At the same time, data generated through digital technologies are limited in scope and representativeness and focus on measurable aspects that may lead disregard of essential non-measurable activities and skills, marginalizing aspects of schooling and students that are not easily quantifiable.

65.   The strict linkage between the education sector and the labour market through digital data raises concern. The digitalization of students' study pathways now can serve as accurate professional résumés to enter the labour market. This is operated with opacity, no right of rectification and the constant surveillance of students whose mistakes can bear important consequences for their future (in the case, for example, of irregular attendance for online exercises). Furthermore, this may lead to the employment sector's overreach in the education sector, valuing only educational pathways relevant to employers and dictating in the end that some courses are simply not delivered anymore.

66.   One main concern of the Special Rapporteur is related to respect for the right to privacy. She recalls that the mere generation, collection, processing and retention of children's personal data can risk or undermine children's rights, including their right to privacy.[39]

67.   These risks and harms were illustrated during the COVID-19 pandemic, when the adoption of online learning by most Governments triggered an unprecedented mass collection of children's data by education technology providers.

68.   In a global investigation conducted by Human Rights Watch of the education technologies that were endorsed by 49 of the world's most populous countries for children during the pandemic, it was reported that the majority of those products put at risk, or directly violated, children's privacy and their other rights, for purposes unrelated to their education. These products secretly monitored children, harvesting data on who they are, where they are, what they do in their classrooms, who their family and friends are, and which kind of device their parents could afford for them to use. Most online learning platforms installed tracking technologies that trailed children outside of their virtual classroom across the Internet over time. Much of those data were sent to advertising technology companies.[40]

69.   Most countries do not have child-specific data protection laws that protect the best interest of the child in complex online environments, and many States have failed to protect children's right to privacy during the pandemic. While some Governments have provided some level of data protection, based, for example, on Regulation (EU) No. 2016/679 of the European Parliament and of the Council of 27 April 2016, others have waived protections to allow digital education to be provided immediately.[41]

70.   Furthermore, many of the Governments that offered their own education technology products for use during the pandemic reportedly introduced products that handled children's personal data in ways that jeopardized or violated their rights. Some made it compulsory for students and teachers to use their product, making it impossible for children to protect themselves by opting for alternatives to access their education.[42]

71.   This continues today. The Special Rapporteur is deeply concerned that targeting children with personalized content and advertisements that follow them across the Internet distorts their online experiences and interferes with their rights to education, information and

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[39] See Committee on the Rights of the Child, general comment No. 25 (2021) and A/HRC/27/37.

[40] Hye Jung Han, *"How Dare They Peep into My Private Life?": Children's Rights Violations by Government-Endorsed Online Learning during the COVID-19 Pandemic* (Human Rights Watch, forthcoming).

[41] A/76/220, para. 8.

[42] Hye Jung Han, *"How Dare They Peep into My Private Life?"*

privacy, as well as their freedom of opinion and expression, at a time in their lives when they are at high risk of manipulative interference.

72. The Special Rapporteur also expresses concern about educational institutions themselves, whether public or private, holding significant amounts of teachers and learners' information (and with it, that of their families and communities), and increasingly tracking them via the monitoring of online activities, surveillance cameras and the recording of educational exchange and interaction. Surveillance by States and governmental entities through digital technologies in education is also of great concern. Another matter of concern relates to the dramatic increase in cyberattacks seeking to acquire and demand ransom for students' personal data.

73. Students cannot truly challenge the privacy arrangements adopted in educational settings and refuse to provide data despite legitimate concerns,[43] either because the data are harvested secretly or because no possibility is offered to decline to be tracked. This is particularly striking in the case of children who cannot opt out of compulsory education. Also when it comes to higher levels of education or professional training, one cannot legitimately ask students to opt out of formal education.

74. Children and young people, with their own data, should not indirectly pay the price for seemingly free-of-charge services. More generally, the Special Rapporteur considers that schools and other educational institutions, including when they operate online, should remain safe spaces for people to develop and exercise their critical thinking and have access to information that is not biased by commercial interests.[44]

D. Threats to face-to-face education

75. Learning requires social interaction, particularly when it concerns young children. As strongly asserted by researchers in the field of psychology and pedagogy, it is fundamental for the construction of learning, motivation and development of a series of skills. More recently, neuroscientists have shown that brain activity is fundamentally different when people interact with others, rather than simply observing.[45] Researchers also emphasize the importance of bodily sensory experiences in human learning activities.[46]

76. Education is about the acquisition of not only information or cognitive skills but also emotional and social abilities, which are developed based on personal connections and a wealth of experiences.

77. Moreover, educational settings as such are places of interaction between all members of the educational community, namely, teachers, parents, learners, families and communities. They are also venues where other services are provided (food, health, protection against violence and so forth), all necessary for the full implementation of the right to education. An intersectoral approach is therefore necessary, which can be threatened by the replacement of face-to-face education by distance online education.

E. Standardization of education to the detriment of cultural diversity

78. Technology may enhance the use of cultural resources present in communities and territories. However, as the digitalization of education allows for the greater globalization of educational approaches and is often proposed through top-down decisions to reduce costs by

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[43] A/76/220, para. 9.

[44] A/69/286, para. 104 (e). See also the Abidjan Principles.

[45] G. Dumas and others, "Does the brain know who is at the origin of what in an imitative interaction?", *Frontiers in Human Neuroscience* (May 2012); I. Clark and G. Dumas, "Toward a neural basis for peer-interaction: what makes peer-learning tick?" *Frontiers in Psychology*, vol. 6, No. 28 (February 2015); L. Schilbach, "On the relationship of online and offline social cognition", *Frontiers in Human Neuroscience,* vol. 9, No. 278 (May 2014); and L. Schilbach and others, "Being with virtual others: neural correlates of social interaction", *Neuropsychologia,* vol. 44, No. 5 (2006), pp. 718–730.

[46] L. Barsalou, "Grounded cognition", *Annual Review of Psychology,* vol. 59 (January 2008), pp. 617–645; and L. Shapiro, *Embodied Cognition*, 2nd ed. (Routledge, 2019).

disseminating products in large scale, there is a risk that digital products may become irrelevant, or unacceptable, to local contexts, needs and priorities.[47]

79.   Concern has been expressed, for example, about the place granted to local languages and diverse world views in digital products and, more generally, about the narrowing of curricula developed by education technology companies.

80.   Observers further indicate that data from the Internet are the fundamental engine behind the creation and development of machine learning models that are used to develop artificial intelligence. Such data sets therefore encode the biases, stereotypes and historical discrimination that are found on the Internet, for example, by using images of tribes to illustrate Africa or promoting sexualized images of women. The larger the data set, the larger the problem in terms of encoding bias and discrimination. As underlined by UNESCO, "AI-systems deliver biased results. Search-engine technology is not neutral as it processes big data and prioritises results with the most clicks relying both on user preferences and location. Thus, a search engine can become an echo chamber that upholds biases of the real world and further entrenches these prejudices and stereotypes online."[48]

81.   Full participation in digitalization processes of communities, including minorities and indigenous peoples, is key to ensuring respect for cultural rights and cultural diversity in education and to allowing for meaningful data to be collected. Such participation must therefore take place in the conceptualization phase, before data are collected. Some communities, in particular indigenous peoples, do not want some aspects of their cultural heritage to be digitalized and their choices should be fully respected in this regard. Indigenous peoples also call for respect for their indigenous data sovereignty and governance, so as to have control over what they consider to be educational priorities and to exercise their right to self-determination. The Special Rapporteur recalls that, in this regard, under article 14 of the United Nations Declaration on the Rights of Indigenous Peoples, indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning.

82.   While policymakers set the general framework of learning outcomes to be reached by the end of compulsory education, schools need autonomy to decide on when and how to introduce specific content and technology in classrooms. They should be encouraged to develop their own approach to digital technologies and media education, involving school leaders, teachers, parents, pupils and experts. Such a collaborative approach tailored to the specific needs and circumstances of a school is best suited for enabling the school to provide appropriate, relevant and inclusive digital media education. Pedagogical freedom, flexibility and diversity of approaches enable a school to be inclusive in its particular school community regarding the socioeconomic and cultural background of its students, teachers and parents.[49]

F.   Threats to the role of teachers as creative professionals and full partners

83.   The digitization of education may imply a reduced role of teachers. The Special Rapporteur considers that supervising and limiting teachers through automated decisions and preventing them from developing pedagogical approaches and from adjusting content to students' interests and needs, as well as to local realities, would be detrimental to the right to education and to cultural diversity. Furthermore, this may lead to teachers' worsened working conditions, a weakened status, their deprofessionalization and the curtailing of their academic freedom.

84.   Governments should put more trust in teachers' ability, creativity and professionalism. Therefore, it is crucial to ensure that teachers develop their digital

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[47] A. Verger, G. Steiner-Khamsi and C. Lubienski, "The emerging global education industry: analysing market-making in education through market sociology", *Globalisation, Societies and Education*, vol. 15, No. 3 (July 2017), pp. 325–340.

[48] See https://en.unesco.org/artificial-intelligence/ethics/cases#biasedai.

[49] See the contribution of the European Council for Steiner Waldorf Education.

competencies and skills and enjoy a high degree of pedagogical and academic freedom to implement the curriculum and to choose the right timing, teaching methods and material in order to develop the digital competence and media literacy of their students sustainably and in accordance with their needs. Teachers should fully participate in decision-making.[50]

G.   Undermining structural approaches and debates

85.   Presenting the digitalization of education as a way to address all problems in education can overshadow necessary debates about structural issues. For instance, the approach of blended learning can be argued as a solution for inadequate ratios of students per teacher and the shortage of trained teachers in some contexts. This approach, however, often prevents the debate around the need for adequate financing for education and long-term planning and policies for teacher training.

86.   Contradicting expectations, digital technology can become a more expensive solution for Governments than other alternatives. For example, in a study in which 44 mobile literacy projects were analysed, it was found that, in only 8, had a formal evaluation of any type been conducted, and in only 1 a randomized control trial.[51] In some cases, there might be limited value added of the technology component, as groups with low-technology tools achieve similar results. Thus, the cost-effectiveness of programmes with digital technology can be much lower than the cost-effectiveness of traditional programmes. Furthermore, if teachers and families are not adequately trained and supported to use technology, this might become a source of stress, resulting in less effective teaching.

H.   Unknown interplay of education, technology and health

87.   Studies increasingly argue that the excessive use of digital technology can have deleterious effects on children and young people's health, in particular psychological, neurological and cognitive effects. Neurologically, screens pose the risk of delaying children's development,[52] for example, affecting the acquisition of language. The excessive use of digital technology can increase the chances of children and young people having depression and anxiety,[53] as well as technology addiction.[54]

88.   Cyberbullying is another emerging issue for students, parents, teachers and schools.[55] While the use of digital platforms and social media can foster a positive sense of social inclusion among children and young people, they also provide spaces for cyberbullying and are associated with body image concerns and, in some cases, eating disorders.

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[50] See the contribution of the European Council for Steiner Waldorf Education.

[51] B. Piper and others, "Does technology improve reading outcomes? Comparing the effectiveness and cost-effectiveness of ICT interventions for early grade reading in Kenya", *International Journal of Educational Development,* vol. 49 (July 2016), pp. 204–214.

[52] S. Madigan and others, "Association between screen time and children's performance on a developmental screening test", *JAMA Pediatrics,* vol. 173, No. 3 (March 2019), pp. 244–250.

[53] S. Domingues-Montanari, "Clinical and psychological effects of excessive screen time on children", *Journal of Paediatrics and Child Health,* vol. 53, No. 4 (April 2017), pp. 333–338; and A.K. Przybylski and N. Weinstein, "Digital screen time limits and young children's psychological well-being: evidence from a population-based study", *Child Development,* vol. 90, No. 1 (January 2019), pp. e56–e65.

[54] N. Kardaras, *Glow Kids: How Screen Addiction Is Hijacking Our Kids – and How to Break the Trance* (St. Martin's Griffin, 2017); and K. Young and C. Nabuco de Abreu, eds., *Internet Addiction in Children and Adolescents: Risk Factors, Assessment, and Treatment* (Springer Publishing, 2017).

[55] A.V. Beale and K.R. Hall, "Cyberbullying: what school administrators (and parents) can do", *The Clearing House: a Journal of Educational Strategies, Issues and Ideas*, vol. 81, No. 1 (2007), pp. 8–12; and F. Cabra Torres and G.M. Vivas, "Cyberbullying and education: a review of emergent issues in Latin America research", in *Cyberbullying across the Globe: Gender, Family, and Mental Health*, R. Navarro, S. Yubero and E. Larrañaga, eds. (Springer International Publishing Switzerland, 2016), pp. 131–147.

89.   Physical effects are also a source of concern, as screens are reported to increase chances of myopia, a sedentary lifestyle, obesity and sleep problems.

90.   Nonetheless, studies show that the health impacts of technology vary according to use and context, in particular the socioeconomic situation of children, making benefits and risks nuanced. Those who receive less interaction and support from families are more likely to experience harmful effects. Thus, the issue of digitalization should not be addressed on its own, but together with wider social issues, particularly inequality, including gender inequality and the support needed by families in terms of childcare. Families also need to increase their understanding of digital transformations undergone by societies to assist and guide their children in an appropriate manner. The risks and opportunities related to children's engagement in the digital space also change depending on their age and stage of development.

91.   Several recommendations have been made for pediatricians and families, prescribing a cautious use of digital devices and encouraging adequate use regarding time, content and support according to age.[56]

92.   Despite all these warnings, school-aged children are increasingly required to use digital media for education. There is a considerable gap in knowledge concerning the health impacts of the educational use of digital media, as most studies analyse only the health impacts of recreational use. Recommendations apply to family circles and are not tailored to include screen time in educational settings or for education. There are no – or few – frameworks of the healthy use of digital technology for educators, teachers and policymakers.

93.   According to the European Council for Steiner Waldorf Education, the healthy physical, emotional, social and mental development of a child is the prerequisite for skilful, independent and sovereign use of digital technology. Age-appropriate and development-oriented media education introduces digital technology in classrooms only after children have demonstrated a significant degree of media maturity and are thus developmentally ready. This is of utmost importance because media maturity and the understanding of digital balance are key in preventing problematic screen media use, which includes digital media addictions.[57]

V.   Conclusions and recommendations

94.   **While digital technologies in education can bring important benefits, they cannot on their own solve the many issues faced by education systems. They carry with them many risks that can be detrimental to the right to education and other human rights within education systems.**

95.   **The introduction of digital technologies should be accompanied by a prior ethical-pedagogical reflection that helps to provide an understanding and to adequately situate their educational impact from the perspective of the full development of the human personality. Digital solutions should be carefully examined for their quality, relevance and consequences for education in the various specific local contexts, with a focus on already marginalized populations, and for their contribution to peace, equity, inclusiveness and sustainable development. Thus, the debate does not simply concern whether technologies are introduced or not, but rather when, how and to what extent, considering positive and negative consequences and their impact on human rights. The best interests of students should always be a primary consideration.**

96.   **The Special Rapporteur recommends that States and other stakeholders, including technology industries and private educational institutions, use an approach focused on the right to education. They should fully take into consideration the human**

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[56] See https://www.open-asso.org/parentalite/ages/0-3/2018/01/comment-encadrer-la-pratique-des-ecrans-des-jeunes-enfants/ (in French), https://www.apa.org/monitor/2020/04/cover-kids-screens and https://services.aap.org/en/patient-care/media-and-children/.

[57] See the contribution of the European Council for Steiner Waldorf Education.

rights legal framework and integrate it into their plans for digital education. This requires in particular:

(a)   The introduction and use of digital technology in a thoughtful, learner-focused and age-appropriate way to improve the availability, accessibility, acceptability and adaptability of education for all;

(b)   The introduction and/or enhancement of digital education for all, which takes into consideration the need of all persons to access, master and use technology as an empowering tool for being active members of society, including in the contexts of professional activities, political and civic participation, finding, using and producing adequate information, partaking in cultural life and building relationships with others. This should include digital agency as a goal;

(c)   Full respect for the rights to non-discrimination and equality, as well as other human rights, such as the right to freedom of opinion and expression, the right to information, academic freedoms, the right to privacy and the right to health. This implies a permanent focus on the most marginalized;

(d)   Full respect for the cultural dimension of the right to education, which means that digital education should be deployed with full respect for people's cultural rights, in accordance with their aspirations, needs, resources and capabilities. Local languages should be integrated into digitalization processes. Students and educators, as well as families, communities and indigenous peoples, should be empowered as full participants in decision-making around digital technologies and their use;

(e)   The protection of students in the online environment from bullying and other such attacks;

(f)   State regulation and control of the use of technology in education by establishing norms and standards, complying with human rights norms and ensuring high quality, relevant and pluralistic content and adequate safeguards;

(g)   That digital education never replace face-to-face education and that no unjustifiable retrogressive measures affecting the right to education be adopted.

97.   States and other stakeholders should pay particular attention to the risk of increasing inequalities in accessing free, quality, public education. The Special Rapporteur recommends in particular that States and other stakeholders:

(a)   Adopt an intersectional approach considering gender, ethnicity, religion, language, disability, economic status and rural versus urban location, as well as the many other factors that may affect how students and teachers experience digitalization and therefore the many ways in which technology may widen rather than reduce inequalities;

(b)   Address the digital divide, as well as impediments in accessing essential technologies, such as a lack of electricity or adequate Internet connections, for students, families and communities;

(c)   Refrain from imposing Internet shutdowns in the territories under their jurisdiction;

(d)   Ensure that the introduction of digital technologies does not introduce hidden costs for education, hence jeopardizing the right to free primary and secondary education, as well as the progressive realization of free higher education;

(e)   Address inequalities through a holistic framework that builds technology literacy beyond educational institutions to include families and communities;

(f)   Ensure or require that technologies for educational purposes be inclusive by design, including for students with disabilities.

98.   States and other stakeholders should ensure that pedagogy leads the decisions about the use of digital technologies in education and that the relationship between teachers and students remains a major pedagogical resource that is not marginalized. They should also:

(a)   Ensure academic freedoms, including in digital education, both of educators and learners, engage them in decision-making processes regarding digital education, and ensure that they can participate creatively in the introduction and design of digital solutions;

(b)   Provide digital training for teachers and strengthen their digital competencies and agency (including in distance learning), offering them the means to maintain, master and configure the technology in their own way, including to develop and use digital content that is articulated with local communities' aspirations and needs. Such training should also allow teachers to master digital tools and programmes elaborated for children and young people with disabilities;

(c)   Ensure that algorithms do not override students' choices of what and how to study and steer career paths.

99.   States and other stakeholders should address the risk of increased privatization of education systems and institutions through digitalization processes. The Special Rapporteur recommends:

(a)   Full abidance to the Abidjan Principles, in particular the adoption of rules and regulations for the private sector in this area, and to the Guiding Principles on Business and Human Rights;

(b)   Coordinated efforts to ensure that education receives adequate financing and that domestic and international budgets are protected to ensure the right to free, quality, public education.

100.   States and other stakeholders should address the risk of increased surveillance of, and mining of data on, students, families and communities, as well as educators and other staff in educational settings. In this respect:

(a)   Child-specific privacy and data protection laws that protect the best interests of children in complex online environments should be adopted and/or implemented at all times. Privacy and data protection laws should also protect adults in any educational setting, including online;

(b)   Child rights impact assessments and data privacy audits should be conducted before adopting digital technologies in education. Categories of sensitive personal data that should never be collected in educational settings, in particular from children, should be defined. Any services procured to deliver online education must be safe for children;

(c)   States should perform due diligence to ensure that the technology they recommend for online learning protects children's privacy and data protection rights; and provide guidance to educational institutions to ensure that data privacy clauses are included in contracts signed with private providers;

(d)   Commercial advertising to students should be banned in all educational settings at all levels, whether private or public, including through digital content and programmes. No data collected within the education system should be used for marketing purposes, and commercial interests should not be considered legitimate grounds for data processing that override the right to education or other human rights;

(e)   States should invest in free and public digital platforms and infrastructure for education, grant adequate funding to public institutions to develop alternative free digital solutions and tools that do not involve the private personal data market, and support the development of non-proprietary data tools, platforms and services that are based around values of openness, transparency and common stewardship (rather than individual ownership) of data. They should prioritize the production and use of content in the form of open educational resources and provide a professional, systematic and personal guiding service to individual users;

(f)   States and other stakeholders should not allow the surveillance of students, families and communities through digital programmes.

101. **More research is needed to provide an understanding of the health impacts of digital technology in the context of education on children and young people. Stakeholders should ensure that age-appropriate and development-oriented digital education includes the prevention of problematic screen use and digital addictions, and develop students' ability to know the difference between healthy and harmful use of digital technology.**