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Challenges of Using ICT to Improve Quality Education for Sustainable Development: Some Remarks*

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Given the wide conception of the term "technology," in the interest of focus and efficiency, I would like to limit my remarks to selected challenges of using ICT to improve quality education and to contribute to steady development. Quite befittingly, my remarks mostly refer to Ethiopian conditions, with public educational institutions in focus.

I choose to concentrate on challenges, not because there are no opportunities to exploit ICT for enhancing educational provision, but because I would like to set the stage for the upcoming deliberations by readers to first give considerable attention to the overwhelming nature of the issues at hand and then inspect the available opportunities in search of answers to the issues raised. I believe that the deliberations should go beyond academic wrestling, which is so characteristic of many university-initiated discussion forums, and shed some light on directions for practical measures that can help to address the issues under consideration.

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I will first make a few observations about the key terms in the overarching topic of the Conference, namely "quality education," "technology," and "sustainable development". Then I will mention some of the challenges in employing ICT to improve quality education. Finally, I will throw in a few ideas by way of opening the way for discussion regarding future action.

Regarding quality education, in the views of many, it comprises competence of different kinds, relevance and a standard that does justice to the coverage and depth or level of a subject matter, skill, and ethics. There are also those who derive the meaning of quality from the nature of the three commonly cited components of teaching and learning; i.e., input, process and outcome. Although all these kinds of views hold a good deal of substance in them, I personally find the UNESCO Four Pillars of Learning (Delors, 1998) more comprehensive and instructive.

The four pillars are products of a study commissioned by UNESCO and consist of *Learning to Know*, *Learning to Do, Learning to Be*, and *Learning to Live Together*. Learning to know is not simply acquisition of information; it also involves learning to learn and engaging in lifelong learning. *Learning to do* is not simply developing vocational and other forms of skills, but also learning how to innovate and take initiatives for action. *Learning to Be* refers not just to forming an identity, but also to be self-regulating and capable of solving one's problems. Lastly, Learning to Live Together captures the ideas of working for a common goal, fulfilling one's civic responsibility and recognizing and respecting the diversity of cultures. To me, these four intertwined mainstays of learning are essential for understanding the quality of education across time and space, including cross-cultural contexts. They are also indicative of human capability to transcend itself.

Concerning technology, to me it is basically a human-made tool created in order to promote quality, quantity, efficiency and dependability in the tasks we undertake to achieve a satisfying life. But technology is susceptible to abuse, which can result in serious harm to its creator. Some kinds of technology, like the cell phone, are also alluringly attractive such that the user can be overawed by their glossy appearance and eye-catching icons and become addicted to them to the extent that he fails to exercise his/her own mental faculties in solving the simplest of tasks. The user could also be indiscreetly servile to solutions that may be generated by technology, without weighing the assumptions behind them. Technology is also a fast-developing phenomenon that requires constant self-updating or follow-up.

Pertaining to sustainable development, I feel that it is a phenomenon that is very sensitive to interferences and disruptions - political, economic, social, etc. and can easily lose momentum under such conditions or even show regression. A case in point is the repercussion of COVID-19 on educational participation which in many cases resulted in learning loss – a loss from which it is difficult to adequately recover through online learning (Cruz et al., 2024). Similar results are most likely to occur in situations of civil war or other forms of instability and conflict.

In addition, I feel that sustained development requires both foresight and hindsight. To wit, there was a time during the Dergue era when comprehensive high schools became the order of the day, but it turned out that many of the so-called "comprehensive" schools seriously lacked the ICT and other equipment they needed for teaching and learning. In hindsight, although the idea behind reforming the high schools was sound, it was based on unwarranted and unforgiving assumptions, and the

lesson so derived should alert us to anticipate possible risks in such ventures and to prepare for them ahead of time.

I would now like to highlight some of the challenges in using ICT in educational service in ordinary classrooms as well as virtual situations. For the sake of convenience, I have classified the challenges into: (1) Resources (including infrastructure and equipment), (2) Strategy (comprising initiative and implementation), and (3) Professional/personal factors.

Concerning resources, the oft-cited issue, particularly in relation to low-income countries, is the shortage of equipment like computers, the difficulty of getting internet access, and power shortages or interruptions. To me, such problems cannot be totally ascribed to financial or resource limitations. In some cases, they are exacerbated by lack of maintenance and deficiencies in management. A related, intractable issue regarding resources is the digital divide between the various regions of the country, urban versus rural areas, the non-disabled and the disabled users, etc. It is hard to conceive of sustainable national development without inclusion. Evidently, there is a need to take the issue more seriously.

The political and administrative aspects of the resource issue are important to consider in discussing the limitations in their availability. It is true that there have been efforts to address the problem, but it appears that competing resource requirements from other sectors have made it difficult to find sufficient resources for effective ICT use in education, despite the fact that education remains the basis of all development endeavors.

Decision-makers may also be in a quandary as to what is better to focus on: the preparation of better-qualified teachers and better textbooks or providing better ICT services. But it should not be forgotten that ICT can positively and noticeably address the needs of both teachers and students. International assistance is often taken as a crutch. Donors may occasionally offer some resources, but such donations are often scanty and tied to research or other types of projects. What is worse, they are sometimes a means of clearing out-of-date equipment under the guise of cooperation or support.

The awareness level and the views of the leadership in educational institutions, including schools, and universities, regarding the use of ICT in educational provision also set a limit to what they can do to make a case for the necessary facilities. In this connection, it appears that in some education bureaus, schools and similar institutions, interest in equipping administrative offices with computers outweighs the interest in equipping teachers with the facilities.

Let me now briefly address the strategy issues in terms of taking initiatives and implementing them. In this regard, the effort by different countries, including Ethiopia, has generally been unsatisfactory. The Satellite Plasma TV project in Ethiopia, which aimed at improving the quality of high school education, has had limited success for a variety of reasons, including deficiency of students in the medium of instruction (i.e. English), frequent power interruptions, the delivery method which was too fast for students and lack of interaction between the virtual teacher and the students (see, for example, Berhanu, 2016).

The Ethiopian National School Net Initiative, the National ICTs in Higher Education Initiative, and the National ICT Education, Training, and Awareness

program also fell short of their intended goals. Tesfaye & Anteneh (2020) have underscored various gaps, including limited capacity building for school teachers in the utilization of information technology.

According to the Ethiopian Ministry of Education (MOE), in 2018/19 for example, 78.7% of high schools in Ethiopia had computers but the computers were not functioning properly in 23% of the schools (MOE, 2019). Notably, the number of computers in each region and each school is left to the imagination of the reader, but there is probably wide variation from region to region and from school to school. The report also indicated that only 21.5% of high schools have internet access. It seems that the availability of the facilities is better in universities but even there internet access remains to be a problem. The condition with respect to university students with special needs looks especially worrisome. One of the First-Generation Universities, for example, could manage to provide visually impaired students only a few computers devoid of screen readers.

Similar experiences concerning projects designed to adopt ICT for improving quality education have been reported in the case of the 1998 Nigerian Computer Policy (Agbetuyi & Oluwatayo, 2012). Ghana's 2011 Basic School Computerization Policy achieved a little better (Natia & Al-Hassen, 2015), but not much. Depending on the particular country under consideration, limitations in resources, inadequate awareness and appreciation of the initiatives, ineffective coordination, and misappropriation of funds probably contributed to the results mentioned earlier. In my opinion, there could also be cultural factors impacting the implementation process such as low sensitivity to time frame in handling plan of action, inadequate appreciation of frequent and fact-

based consultations through electronic or other means, and lack of readiness to amend one's malpractices and decision-making procedures to better suit the initiatives.

Proceeding to the third and last problem area of my interest, namely, professional and personal factors that contribute to inadequate utilization of ICT for enhancing quality education, one main factor relates to beliefs about the powers of ICT and attitudes toward their use. In some cases, students and even teachers assign ICT the status of a deity that is to be revered and trusted in all the functions it performs, and in what it produces. As a result, there is often indiscriminate use of it as in the case of the famous (and some would say notorious) PowerPoint classroom practice that pervades our campuses. In teaching and learning, power point can be useful only to the extent that it is based on proper application of principles of multimedia use (Mayer, 2009; Waxman & Goldie, 2023). Aside from stifling reflective thinking, technical shortcomings in its utilization may induce a loss of interest in the subject of engagement which has been hyperbolically known as "Death by PowerPoint" (Felder & Brent, 2005). To take another perspective, many ICT users in education may be knowledgeable of the basics of the tools they use but may not be sufficiently proficient in utilizing them for learning and discourse as in the case of online learning or Zoom teleconferencing.

The ethical issue in assessing databases is also a prime concern. Today AI generator can produce a dissertation directly drawing on sources available on the Internet which means that academic integrity and scientific advancement are at stake. Misinformation via electronic media can damage quality of education. Indeed, at a time when AI can come up with a sonnet not unlike those of Shakespeare, the individual learner may easily trade his brain for a machine.

In conclusion, I would like to put forward a few ideas which readers may entertain or develop in discussing actions that could be undertaken in the face of the overwhelming challenges of using technology, particularly ICT, to enhance quality education for sustainable development. In this regard, I feel that a re-evaluation of past efforts not just by the Ministry of Education but the Ministry jointly with other stakeholders, including universities, could be useful to correct past oversights and errors.

There is also a need to expand computer literacy and create the proper attitude towards its use. Developing a model for ICT use in education – a model which involves, among others, the pedagogical aspects is important. Educational institutions must systematically respond to the calls of the Four Pillars of Learning which I mentioned earlier and possibly to the fifth one of my own creations, namely *Learning how to Survive under Turbulences*, through the use of appropriate technology, including the development or responsible adaption of context-relevant courseware. Inclusiveness in practical terms should be high on the agenda of not only educational institutions of all levels and the higher echelons of government.

Whatever fruitful efforts made by the government, although utterly inadequate, should be given due credit. However, the involvement of the private sector in supporting the effort to advance the use of ICT and educational technology in general can be beneficial. An up-to-date, stringent, and context-relevant regulation comprising ethical standards and requirements is also desirable. Above all, there is a need for strengthening political will that is concretely translated into action on the ground to advance quality education. Circumspection and the unfettering of bureaucracy should go hand in hand with such political will. On their part, universities should give leverage

to efforts aimed at integrating the use of ICT in education, not just in terms of enabling users to be tech-literate and tech-critical but also for the purposes of improving project design and evaluation, and for system development. It makes a good deal of sense to think of such engagements as multi-disciplinary, involving such areas as information science, psychology, and neuroscience.

To pick up another decisive issue, social strife is inimical to quality education and, by corollary, to sustainable socio-economic progress. Sagacity on the part of those who wield political power and the general community is essential for averting or dealing with such aberrations. Under traumatic conditions, ICT and, more broadly, educational technology will have limited or even deleterious impact on quality education and sustainable development.

To sum up, the task at hand is daunting, and the solutions are complicated involving political, economic, governance, and social dimensions. As such, they require commitment and partnership by all concerned – with the higher echelons of government paving the way.

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