Technology Integration for Quality Education: A study for Equity and Justice

Amrit B. Thapa

Abstract

There is a long history of more than six decades of technological development and its incorporation in education. A large volume of literature and research focuses on the importance of technology integration in order to create an educational environment conducive to a higher-order learning opportunity. Adaptation of technology became more pertinent in the present context of COVID-19 pandemic. However, there are concerns about whether all learners worldwide are getting equitable access to technology in learning. In this context, this paper studies some policy documents from Nepal to explore how technology is integrated to enhance learning. Further, this paper compares Nepal's technological integration based on the common core state standards from the United States. This literature review identifies that Nepal's educational authorities need serious attention to invest in technological infrastructure and prepare for technology integration in education. This paper aims to inform and evoke policymakers, school/college leaders, teachers, and parents to put an effort to incorporate technology as one of the inevitable means to quality education.

***Keywords*:** Technology, Software, Technological Integration, Fidelity, Equity, Justice, Technological Infrastructure

Introduction

There is a vast amount of literature stressing the rapid development of technology and the benefits of its incorporation in teaching and learning. Also, there are ample educational software and platforms to support teaching and learning; and many of them are either entirely free or are free for basic features. In this paper, I present a brief history of educational technology development and its integration in education. Further, I bring in literature that discusses integrating technology in education at the policy and practice level.

This paper aims to explore the state of technology integration in vision, policy, and day-to-day teaching and learning in Nepal. I will investigate the vision and plan expressed in the National Curriculum Framework for Education in Nepal and the grade nine curriculum for compulsory mathematics.[1]. I am taking compulsory mathematics as a representative of other courses at the high school level in Nepal. Further, I will study how the Teacher Guide (commonly known as Sikshyak Nirdeshika in Nepal) and the government-published text-books follow the vision for technological integration. For reference, I will review the vision and recommendations of Common Core State Standards of the USA. The discussions will be based on equity and social justice perspectives.

Progression of Technologically Enhanced Education

Suppes (1966) discussed around 55 years ago that computer technology is increasing and taking calculation and information processing to a new level of speed and complexity. He indicated that computer technology's evolution

[1] *Compulsory Mathematics is a mandatory mathematics course for all students in Nepal, and there is additional mathematics commonly known as 'Optional Mathematics'.*

would benefit the day-to-day human rituals, and it will be a marvel to education. He says,

... the - processing and the uses of information are undergoing an unprecedented technological revolution. Not only are machines now able to deal with many kinds of information at high speed and in large quantities but also it is possible to manipulate these quantities of information so as to benefit from them in entirely novel mays. This is perhaps nowhere truer than in the field of education. (p.207)

He envisioned that school children around the globe would benefit from the vast innovations in technology. The use of technology will provide children with a large and easy source of information and knowledge. Computer ability to manipulate information will make it possible to use a computer for the representation of information and their interaction which may be complex to understand or visualize without technology. And visualization supports higher-order thinking and imagination. Suppes further indicated that the evolution of computers would have an enormous impact on the instructional approaches. He further says, "This role of the computer is scarcely implemented as yet but, assuming the continuation of the present pace of technological development, it cannot fail to have profound effects in the near future" (p.207). He stresses that there will be a severe impact on how the instruction takes place in the classroom. Moreover, he is highly optimistic about the profound positive effect on teaching and learning.

Kaput (1992) contends that it is no more useful to discuss whether computer technology is valuable. He argues that computer modes of children's learning do an excellent job supporting children's intellectual power to mathematical achievement. We need to discuss further how to enhance it. Foley (1990) wrote a paper, an extension of a conference workshop, 30 years back, about using hand-held graphing computers in teaching mathematics. He stressed that hand-held graphing computers facilitate interactive experimentation and

support in concept development. He further said, “Hand-held graphing computers with their in-teractive graphics capabilities have profound implications for what we can and should teach and how we should teach it.” (p.36). Today's children need to imagine and think beyond the memorization of facts, and to do so, we need to relieve them from the mere process of reproducing facts (Roschelle at al., 2017). As teachers understand the range of ways students learn in a technological environment, teachers can conceptualize the nature of discourse and organize learning accordingly. More the teachers learn technology and experience it in teaching, lower will be the anxiety of using it (Heid et al., 2002).

Faith in Technological Tools and Educational Integration

Dick (2008) talks about fidelity in his chapter 'Fidelity in Technological Tools for Mathematics Education'; he refers to three basic principles, pedagogical fidelity, mathematical fidelity, and cognitive fidelity. By pedagogical fidelity, he refers to the fact that technological tools are not developed for education or are not developed by educators. Technological tools and software need to be designed and programmed to facilitate learning and align with the curriculum's goals. It should also not pose a problem with cosmetic features or demand extra hardship to learn its technicalities. So, it has to be user-friendly for both teacher and student. Mathematical fidelity refers to the alignment of the processes, representations, and concepts that technological tool carries out should align with mathematical facts. There may be technical limitations in the tools that may hinder the actual learning that should take place. Technical difficulties need not pose an additional problem in the learning process. Definitely, technological development is an ongoing process, but this has to be well communicated with teachers who are the designers of the lessons. Finally, Dick explains cognitive fidelity as the resemblance of the computer's process of results needing to surpass the thinking process. In many cases, it is observed that the computer's solution is sophisticated than the learner, and it makes learners feel less intelligent and or get confused when relating to real-world problem-solving.

What the Future Looks Like?

Michio Kaku is a professor of theoretical physics and has written various popular books. In his book 'The Future of Humanity' (2018), he writes,

The next target may be to record the memories of patients suffering from Alzheimer's disease. Then we can place a "brain pacemaker" or "memory chip" on their hippocampus, which will flood it with memories of who they are, where they live, and who their relatives are. ... We will need to study and refine this technique, but by the late twenty-first century, it is conceivable that we might be able to upload complex memories into our brain. In principle, we might be able to transfer skills and abilities, even entire college courses, into our brain, enhancing our capabilities almost without limit. (p.343)

He explains how technology is advancing and changing the way we live. He provides an extensive explanation as to why we need to advance to escape extinction as dinosaurs did due to an inability to evolve. He presents scientific proofs and logic to stress that technological innovation is inevitable. We are heading towards innovations to stretch our life span, robotic and automated transportation, more advanced communication systems, new ways to energy generation, and space travel.

Elon Musk, entrepreneur and co-founder of companies such as SpaceX and Tesla, shares his ongoing projects such as fully automated vehicles and 3D tunnel networks (TED, 2017). Technological innovations are changing our lives in new ways that we would find difficult even to imagine. Furthermore, the question is, are we preparing our children to be intelligent to work in this direction? Are our schools providing enough opportunities and exposure to students for it? Are our children preparing to fit onto the jobs that will be vastly different due to these innovations? STEAM education (Shatunova, et al., 2019) is becoming popular in addressing these requirements.

Equity, Social Justice, and Educational Technology

Dunham and Hennessy (2008) define digital equity as, "Digital equity is a social justice construct that includes access to educational technology (machines, software, and support) as well as to high-quality curricular and pedagogical resources that provide opportunities for using technology to facilitate learning for all students" (p.348). The authors discuss different forms of equity issues in technological integration, such as equal opportunity to learn, access to computers and the internet, and access to hand-held technology.

The authors contend that even though technology accessibility has significantly improved, this is still inaccessible to students of color, ethnic groups, and students who live in economically deprived communities. And, this is more evident in the contexts of underdeveloped countries. Another part of it is that computer technology availability is not enough, and it is essential whether the resources are functional and are effectively used in teaching purposes. For effective teaching, the curriculum should incorporate technology as an inherent component than a supplemental tool. In addition to this, teachers, school leaders, parents, and other stakeholders need to be well informed, motivated, and prepared to support it.

Grant & Eynon (2017) discuss how and why technology-enhanced learning can both support social justice and become a part of injustice in itself. They say,

Digital inequality is a social injustice itself, but some research also explores how technology-enhanced learning might offer opportunities to address other social inequalities. ... No form of technology-enhanced learning can therefore be seen as a sure-fire route to overcoming social injustice, but there may be some ways in which it can play a supporting role when it is developed with an understanding of, rather than assumptions about, the particular people the intervention is aiming to support. (pp.162-163)

In the context of economically deprived countries like Nepal, where schools are poorly funded, and many children are out of school, access to technology for all the children is difficult to imagine. However, a highly encouraging aspect of technology integration is that it can provide cheap and easy access to those out of school or poorly supported in their learning. Digital resources are easily transportable, and a massive amount of them can be accessed for free. We are in the complex mode of conversation about social in/equity. We cannot deprive young citizens of having access to technology and prevent them from becoming global citizens. At the same time, we have an onerous responsibility to bring those far away from the digital world.

Policy Study between USA and Nepal

In this section, I will present a study of documents from the USA and Nepal to compare and contrast the educational policy on technological integration in education and its implementation. US government does not have a specific publication for all the schools in the country, so I will analyze the Common Core State Standards, a primary reference for what and how education occurs. However, different states may have their standards based on the common core state standards. In the case of Nepal, I will analyze Nepal Government's policy and implementation documents 'National Curriculum Framework for School Education in Nepal', 'Teacher Guide, Mathematics, Grade 9', and 'Mathematics Book, Grade 9'. I believe that these documents will provide significant information about the vision and implementation of technological integration in education.

Common Core State Standards

Common Core State Standards (CCSS, abbreviation) is a common standard developed by the state education chiefs of the United States of America for kindergarten through 12th grade in English language, arts, and mathematics. This initiative started in 2010. I present some aspects of vision and recommendations the common core state standards (National Governors Association, 2010) has offered. The Common Core State Standards states,

"... all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives." (p.4). The standards stress that all the students must be provided with equal opportunity to participate in educational activities to achieve the knowledge, skills, and attitude to succeed in post-school life. To ensure maximum participation of students with special needs, it suggests using screen reader technology or other assistive devices such as scribe, computer, or speech-to-text technology.

Here, to provide a glimpse of the current situation, I choose to analyze the state standards on Mathematics specifically for high school. CCSS has set 8 standards for mathematical practice, and the sixth standard is, "Use appropriate tools strategically". It says,

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. (p.7)

The standards recommend different tools that facilitate mathematical learning. Including traditional mathematical tools such as paper and pencil, concrete model, and a protractor recommends using technological tools such as a calculator, a spreadsheet, a computer algebra system, a statistical package, and dynamic geometry software. It is important to note that CCSS has listed the technological tools as an essential teaching and learning tools. It further stresses that students must be exposed to experimentation and develop strategic use of technology to play with data or tools to build models, predict, practice, and learn problem-solving skills. Use technology for higher-order thinking and understand mathematics at a deeper level. It does not talk

specifically about using the technology until grade 8, but it provides specific recommendations for different topics for high school.

CCSS specifically mentions using technology to visualize how the solving of two functions means. It expects students to learn to draw graphs by hand and then explore technology for different forms of graphs and see and analyze how these systems of functions work in more complex situations. It presents much emphasis on the use of technology in mathematical modeling and statistics. It says,

Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is choosing and using appropriate mathematics and statistics to analyze empirical situations, understand them better, and improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. (p. 72)

CCSS emphasizes the importance of modeling and statistics in the context of a data-driven world. Technology can help understand simple to complex models of day-to-day, social, political, and scientific phenomena. It states that manual skills are insufficient to understand and present complex interaction of variables, and technological assistance is a great way to address it.

Overall, Common Core State Standards has placed technology as an essential medium for understanding mathematics better and to ensuring engagement in higher-order thinking and problem-solving. It has provided explicit instruction to policymakers, teachers, and other stakeholders about the importance of technology integration in teaching mathematics.

National Curriculum Framework for School Education in Nepal

National Curriculum Framework (2007) mentions 'ICT based education in the list of 19 different contemporary curricular issues and challenges identified, 'information and communication technology' is mentioned in the category 'Principles of curriculum development'. This indicates the National Curriculum Framework (NCF)'s the identification of technology as an essential aspect of education. NCF says,

In the context of 21st century human rights, child rights, peace, gender, and social equity, population education, and environment conservation, including global information and communication technology have become the emerging needs. Therefore, it is necessary to spell out the vision of education. Rights to quality education for all can only be ensured if education is taken as the major tool for social transformation and economic, cultural and political advancement. (p.6)

NCF laces information and communication technology as one of the 21st century human rights. It considers ICT as emerging needs for education and education for social, economic, cultural, and political transformation. NCF also has placed ICT in the five major areas to be addressed. This realization of NCF is also a good indication of NCF's inclination towards technology integration in Nepal's education.

NCF says that it understands 21st-century human civilization has entered the era of information and communication technology. It also acknowledges that ICT is an important tool to facilitate education.

Challenges in incorporating ICT in education

Besides recognizing the importance of technology, NCF has listed four main challenges incorporating ICT in Nepal's education. The four challenges are:

- ICT has not been properly addressed by the curriculum.

- ICT as a subject or as a tool of teaching-learning has not been clearly defined.
- No vertical consistency of technical subjects including computer education from
- lower to a higher level of education.
- Lack of adequate physical infrastructure, conducive environment, and efficient
- resource persons (p.18)

It is essential to note NCF has recognized that the curriculum does not address ICT; while text-books, teacher development, and classroom practices must be developed accordingly. Another challenge NCF mentions is the lack of distinction of ICT as a subject and as a teaching-learning tool. If it is simply included as another subject, then the prospect of benefits will be limited.

One of the most critical aspects of the technological challenge NCF noted is the lack of adequate technical infrastructure in school systems. It also points to the lack of resource persons who can educate teachers and support in designing lessons for effective implementation. Though the document states 'conducive environment,' it does not discuss much. It appears that the concept of ICT use in teaching is not well conceptualized.

Instructional Approach

NCF realizes that there is a need for rethinking the instructional approach. This framework admits that the current practices are teacher-centric, focusing primarily on text-book-centric teaching that relies mostly on teacher instruction and memorization. It also stresses that the current instructional approach ignores the use of technological tools. In this regard, NCF says,

... the challenge of the day is to develop and implement curricula and curricular materials in good coordination with stakeholders to transform teaching into learning, establish collaborative learning, design child-centered instruction by

using information and technology, learning through project work and group work. (p.22)

NCF stresses that technology can enhance transforming teacher-centric teaching into student-centric. It mentions using project work and group work as new approaches to education. However, it does not explain how technology may strengthen the project's development and meaningful discourse for deeper thinking. It does not provide a guideline or concrete support for educators.

National Educational Objectives

Part-three of the NCF talks about national educational objectives, the vision of school education, and curricular principles. It says, "Prepare globally competent human resources knowledgeable to modern information technology and use it" (p.31). It is appreciable that technology has a place in the list of objectives. However, there is no clear indication of whether the technology is expected to be used for the teaching purpose or just teaching it as a subject matter. It has used a separate title with 'Information and Communication Technology' as a symbol of showing importance. In this section, it says,

The curriculum will make special room for Information and Communication Technology. In the context of globalization, it is essential to incorporate ICT education in school curricula; however, in our context it is not that convenient. If this new area of learning is not included in the curriculum, the youths will be deprived of today's global educational reality. Thus, the curriculum will be designed by acknowledging ICT education as a subject or medium in order to bring educational transformation. (p.36)

NCF has tried to emphasize its attention to the value of using information and technology for educational purposes. It is essential to mention here the choice of words 'subject or medium'; this indicates that NCF realizes its

intention to recommend using ICT as a subject and a medium of teaching. Further, it says, "Information and communication technology and self-learning materials will be developed to facilitate open education system." (p.38). This statement indicates that NCF thinks of using technology to develop distance learning programs and promote self-learning. However, it does not discuss much about the current technological infrastructure and progression towards integration to education.

Overall, the document shows that NCF has identified technology as an essential part of education in the present global context. However, the discussions appear to be *wishful thoughts* than a strategic plan to develop and implement. There is confusion about defining technology as a subject matter to study or a tool to enhance teaching and learning, or both. The framework does not discuss enough about the current situation of technological use in the school system in Nepal. Most importantly, this framework does not show or indicate a clear path or strategy for developing technological infrastructure (Kaput et al., 2007), and creating a conducive environment for technological integration in curriculum and pedagogy.

Teacher Guide, Mathematics, Grade 9

Here I review the document 'Teacher Guide' for grade nine mathematics teachers (Ministry of Education, 2020) to explore the extent to which it tries to encourage and facilitate the incorporation of technology in classroom teaching. Interestingly, the word search tool recognized two words with 'प्रबिधि' (Technology) in the whole book of the instructional guide of 183 pages. And these words are also not used to indicate technological use in instructional purpose but are in the word problems that consisted of the technical term in the context. The guide nowhere tries to aware, encourage, guide, suggest, or recommend teachers for technology use. This document neither talks about any technological infrastructure nor mentions or suggests any software or tools used for the teaching purpose. Neither is there any discussion or explanation about the possibility of using any technological tools, nor are

there any examples or teaching samples that would motivate teachers to use technology.

Mathematics Book, Grade 9

Here, I try to explore the extent to which the text-book (Ministry of Education, 2018), published by the Ministry of Education of Nepal, incorporates technological integration. Interestingly, the word search tool returns only two results when searched for the word 'Technology' and returns 'Computer' with only one result. Technology first appears in the 'Preface' of the book that talks about how mathematics relates to different learning aspects, indicating mathematics is useful for communication and technology. Secondly, it appears in the topic 'Household Arithmetic,' which deals with word problems that relate arithmetic to household activities or requirements such as electricity bills, water bills, and telephone bills. It says,

The customer can get information and pay the bill of electricity, water and telephone etc., from their houses by using information and communication technology (ICT). For example: to know about the amount of bill of PSTN, we can dial 1606 using the same telephone. The main objectives of introducing ICT is that to make customer used paying their bills through online but not in the queue (line). (p.35)

In this paragraph, the book presents ICT as a context of the problem, but it does not link to technology for teaching purposes. The text-book does not provide any recommendation or support for teachers to use technology in teaching mathematics. There are no examples that use technology to demonstrate patterns or make visualization easy, nor are there recommendations for teachers about using any useful tools or software that would enhance teaching. There is no indication of any kind that would support or inspire teachers for technology use.

Discussion

The study of the National Curriculum Framework (NCF), Teacher Guide for Mathematics, Grade 9, and the coursebook 'Mathematics Grade 9' shows no policy and strategic plan of action for technological integration in education, in Nepal. NCF has repeatedly mentioned its seriousness in the integration of technology. However, there is no clear path or strategy to develop infrastructure and to develop teachers for it. The teacher guide and text-book do not say anything about technological integration for instructional purposes. Neither of these documents provides any sample activities or suggests technological tools to help teachers use technology for instructional purposes.

Comparing the policy documents of Nepal and Common Core State Standards (of USA), there is a massive gap in the use of technology in education. Common Core State Standards not only has a clear vision of technological integration, but it has a clear recommendation for the use of software in teaching and learning. However, the Ministry of Education of Nepal neither has a clear vision for technology integration nor a clear infrastructural development plan. This digital divide must be a severe issue for the global community to research and address the inequity (Dunham & Hennessy, 2008) created due to the digital divide (Kalolo, 2019). Lack of technological integration compromises the depth of learning that can happen through technology and prevents new generations from countries like Nepal from entering into the global world of intelligence, which is taking a leap to a multi-planetary being. On the simplest level, lack of technological exposure will keep the learners away from lucrative jobs and careers in the market. So, technological integration in education is necessary (may not be sufficient though) for social equity and social justice. Though there are challenges, it is an inevitable journey.

Recommendation

The literature review shows a severe lack of the Nepal Government's vision and action plan towards integrating technology in education. While one part of the world aims to transform human life systems beyond planetary humanity, another part of the world, like Nepal, is lost in the old teacher-centric paper and pencil instruction. People in policymaking, educators, and other stakeholders need to act fiercely towards 21st-century education (UNESCO, 2017). Following are the list of recommendations:

- We must develop both short and long-term vision and policy for a technologically enhanced education.
- We must set a minimum standard of technological infrastructure for government, public, and private institutions.
- We must revise the curriculum to a technologically enhanced curriculum and develop teacher development programs accordingly.
- We must seek support from the international community both for knowledge and infrastructure.
- The international community must initiate concrete programs to encourage and support economically deprived nations for equitable access to technologically enhanced education.

Finally, the COVID-19 pandemic has pushed all of us to envision new and alternative ways of the traditional approach to teaching. Teachers all over the world experienced enormous possibilities of transformation that technology can bring. Teachers, students, and parents got to see the use of technology for education beyond social media and entertainment. Specifically, teachers have explored a vast amount of ready-to-use and useful to use digital materials freely available on the web. Clearly, there are numerous challenges in harvesting digital resources for equitable access to all. Central and local governments, educational organizations, business corporations, and other stakeholders need to come forward to support the development of technological infrastructure. In addition to this, an initiative from institutional leaders, teachers, and parents can make a difference in this process.

Authors:

Amrit B. Thapa is a PhD candidate at Ohio University, Ohio, USA. His research works focus on curriculum and instruction for empowerment and justice.

Reference

Dick, T. (2008). *Keeping the faith. Research on technology and the teaching and learning of mathematics: Cases and perspectives*, *2*(2), 333–339. In G. W. Blume, & H.K. Heid (Eds.), *Research on technology and the teaching and learning of* mathematics (Vol.2, pp.333–339): Cases and perspectives. Information Age.

Dunham, P. & Hennessy, S. (2008). *Equity and Use of Educational Technology in Mathematics*, *2*(2), 333–339. In G. W. Blume, & H.K. Heid (Eds.), *Research on technology and the teaching and learning of* mathematics (Vol.1, pp.345–418): Cases and perspectives. Information Age.

Foley, G. D. (1990). Using hand-held graphing computers in college mathematics. In F. Demana, B. K. Waits, & J. G. Harvey (Eds.), *Proceedings of the Conference on Technology in Collegiate Mathematics (*pp. 28–39). Reading, MA: Addison-Wesley.

Government of Nepal. (2007). *National curriculum framework for school education in Nepal*.

Grant, L., & Eynon, R. (2017). Digital divides and social justice in technology-enhanced learning. In *Technology Enhanced Learning* (pp. 157-168). Springer, Cham.

Harris, A., & de Bruin, L. R. (2018). Secondary school creativity, teacher practice and STEAM education: An international study. *Journal of Educational Change*, *19*(2), 153-179.

Heid, M. K., Hollebrands, K. F., & Iseri, L. W. (2002). Reasoning and justification, with examples from technological environments. *The Mathematics Teacher*, *95*(3), 210.

Kaku, M. (2018). *The future of humanity: terraforming Mars, interstellar travel, immortality, and our destiny beyond Earth*. Anchor.

Kalolo, J. F. (2019). Digital revolution and its impact on education systems in developing countries. *Education and Information Technologies*, *24*(1), 345-358.

Kaput, J. J. (1992). Technology and mathematics education. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 515–556). Macmillan.

Kaput, J. J., Hegedus, S., & Lesh, R. A. (2007). Technology becoming infrastructural in mathematics education. In R. A. Lesh, E. Hamilton, & J. J. Kaput (Eds.), *Foundations for the future in mathematics* education (pp. 173–191). Erlbaum.

Ministry of Education. (2018). Mathematics, Grade-9: Curriculum Development Centre.

Ministry of Education. (2020). शिक्षक निर्देशिका, गणित, कक्षा (Teacher Guide, Mathematics, Grade 9). SanoThimi: Curriculum Development Centre.

National Governors Association. (2010). Common core state standards. *Washington, DC*.

Roschelle, J., Noss, R., Blikstein, P., & Jackiw, N. (2017). Technology for learning mathematics. In J. Cai (Ed.), *Compendium for research in mathematics education* (pp. 853–876). Reston, VA: National Council of Teachers of Mathematics.

Shatunova, O., Anisimova, T., Sabirova, F., & Kalimullina, O. (2019). STEAM as an Innovative Educational Technology. *Journal of Social Studies Education Research*, *10*(2), 131-144.

Suppes, P. (1966). The uses of computers in education. *Scientific American*, *215*(3), 206-223.

TED. (2017, May 3). *The future we're building -- and boring* | Elon Musk [Video file]. https://www.youtube.com/watch?v=zIwLWfaAg-8

UNESCO. (2017). E2030: Education and skills for the 21st century. In *Regional Meeting of Ministers of Education of Latin America and the Caribbean*. Buenos Aires, Argentina: UNESCO.