Educational Technology and Economic Take-off: Keys and Challenges

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Abstract:

Through a descriptive approach, the paper aims to discuss the main challenges of education technology facing economic take-off, and how it can be key at the same time, in order to contribute to the discussion related to the importance of educational technology in achieving an economic take-off in Algeria in terms of technological readiness, the role of the teacher and other relevant points. This study recommends, the need to develop new competencies and new technologies in education, based on the fact that Algeria and many developing countries are facing huge challenges in achieving their economic take-off,

Key words:
Jel Classification Codes: O15

الملخص:

تهدف الورقة من خلال منهج وصفي إلى مناقشة التحديات الرئيسية لتكنولوجيا التعليم التي تواجه الإقلاع الاقتصادي ، وكيف يمكن أن تكون مفتاحا في الوقت نفسه. وذلك بغية المساهمة في النقاش المرتبط بأهمية تكنولوجيا التعليم في تحقيق الانطلاق الاقتصادي في الجزائر من حيث الجاهزية التكنولوجية ودور المعلم ونقاط أخرى ذات صلة. توصي هذه الدراسة وانطلاقا من كون الجزائر والعديد من البلدان النامية تواجه تحديات ضخمة في تحقيق إقلاعها الاقتصادي ، بضرورة تطوير كفاءات جديدة وتقنيات جديدة في التعليم.

الكلمات المفتاحية:

تصنيف JEL:

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Educational technology focuses on the technological tools and media that assist in the communication of knowledge, and in its development and exchange. It combines the use of computer, educational theory and practice to facilitate learning. Educational technology has been used long time ago. However, the Corona pandemic imposed it strongly, and it becomes a necessity and an imperative, especially, in teaching and learning spheres alike, sociological and economic point of view. The education represents one of the main determinants of the composition and growth of that country's output and exports. As it constitutes an important ingredient in a system's capacity to borrow foreign technology effectively[1]

Before growth becomes a built-in feature of a society's habits and institutions, countries must achieve the economic take-off, as its historical contexts and development mentioned in the several theoretical background, the economic take-off is consisted, in essence, of the achievement of rapid growth in a limited group of sectors, where modern industrial techniques are applied[2]. Industry is linked to technology and technology depends on suitable and qualified education system which has changed its methods. Technology has become a major factor in its development. This relationship has made education technology a key to economic take-off and a challenge, especially for under developing countries that face a difficult development situation. Education has been benefitted by technology in various way and at various levels and also technology represents a big challenge. The question arises how educational technology can be a key and a challenge especially for developing countries, and particularly for Algeria?

Hence, the paper aims through a descriptive approach to discuss the major challenges of educational technology in Economic Take-off, and how it can be the key to, in order to

[1]Ozturk, Ilhan , The role of education in economic development: a theoretical perspective, availableat:https://mpra.ub.uni-muenchen.de/9023/1/THE_ROLE_OF_EDUCATION_IN_ECONOMIC_DEVELOPMENT.pdf 31/03/2023

[2] W. W. ROSTOW**, THE STAGES OF ECONOMIC GROWTH**, ECONOMI-C HISTORY REVIEW SECOND SERIES, VOL. XII, No. I, 1959.

contribute in the discussion that is related to the importance of educational technology in achieving economic take-off in Algeria in terms of technological readiness, the role of the teacher and other relevant points. Algeria is a country that is required to achieve this desired take-off by choosing its most important strategic sectors with new perceptions and mechanisms. In all Algerian choices, educational technology remains among the most important keys and challenges of economic take-off at the same time.

1/ Definition of Educational Technology:

There are many definitions of educational technology, including the definition that considers it as" a process of solving educational problems and concerns, which might include motivation, discipline, the drop-out rate, school violence, basic skills, critical thinking, and the whole list of educational concerns".[1]It is "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources."[2] .Educational technology is a "systematic application of relevant technological processes and resources in teaching, with a goal to improve students' performance. It involves a disciplined approach to identifying the needs of students, applying technology in instructions, and tracking their performance"[3].

Educational technology thus refers to the use of both physical hardware and educational theories. It en-compasses

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[1]Educational Technology: An Overview, available at : https://educationaltechnology.net/educational-technology-an-overview/ (20/01/2023.

[2]Michael Brückner, Educational TechnologyRelated articles from the Wikipedia (Feb. 14, 2015),availlable at : https://www.researchgate.net/publication/272494060_Educational_Technology.

[3]Concept of Educational Technology ; availlable at: https://mis.alagappauniversity.ac.in/siteAdmin/dde-admin/uploads/4/__UG_B.Ed._Education_70141%20-%20Educational%20Technology_4262.pdf.

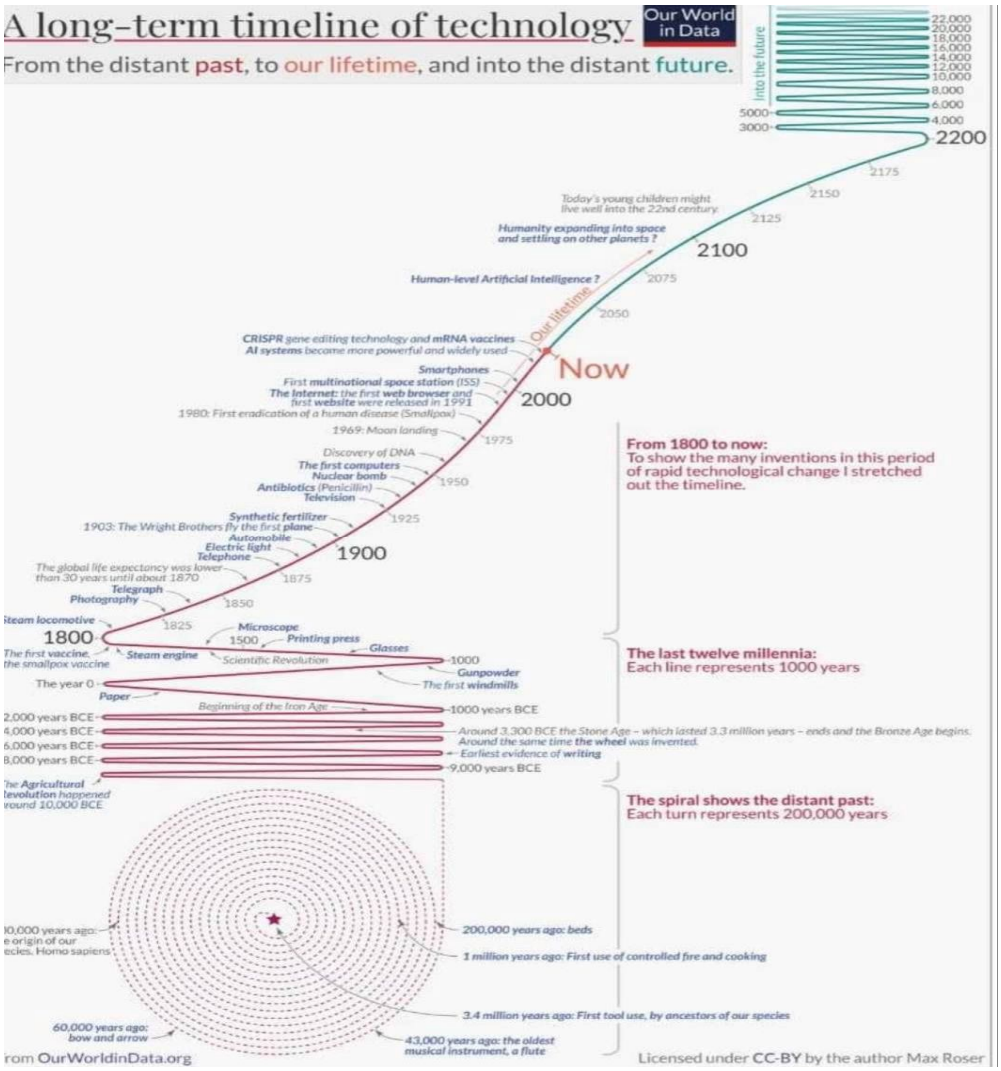
several domains, including learning theory, computer-based training, online learning, and, where mo-bile technologies are used, m-learning[4]. Educational technology has three domains of use: Technology as a tutor (computer gives instructions and guides the user), History has revealed that technology strengthens the hands of a teacher and makes his/her teaching more effective. Technology as a teaching tool and Technology as a learning tool .

Technology was used to facilitate education from the early 1920s, when testing machine enabled students to test themselves. Radio was an effective means of education to impart knowledge towards a massive audience, and television programs produced for educational purpose have provided people of all age groups with opportunities of learning with low cost. Ever since the computer brought Computer Assisted Instruction (CAI) into being, learning modality has been continuously evolving, enabling Web Based Instruction (WBI), which is based on the internet, Mobile Learning, and Ubiquitous Learning, which became possible by the invention of Cloud system)[1](The figure 1 illustrates the development of the main technological tools along-term timeline).

Figure 1:The development of the main technological tools along-term timeline

[4]Michael Brückner, OPCIT, p16.

[1]CHI, Younsuh, EDUCATIONAL TECHNOLOGY AS A KEY ENABLER FOR ACHIEVING THE SUSTAINABLE DEVELOPMENT GOAL 4, MASTER OF DEVELOPMENT POLICY, KDI School of Public Policy and Management, 2018.



2/ **Educational Technology asa Economic Take-off Challenges**

Two main challenges face Economic Take-off Challenges, The use of Educational Technology question, and the role of teacher:

2/1 The use of Educational Technology question: For many years, the debate has revolved around the question of advantages and disadvantages between traditional and modern teaching where the prevailing educational technology. The period from 1967 to 1972 is

considered to be a period of consolidation of educational technology, which has become the most commonly used term in the science of pedagogy and the educational process[1].The world today is a small village, and education became possible from anywhere and at any time without the need for a face presence.For this reason the use of technologies influences education in generaland teacher role in particular.Using Augmented Reality AR and Virtual Reality VR to enhance teacher instruction while simultaneously creating immersive lessons that are fun and engaging for the student. (The picture bellow shows a example of using technology in education).

Figure 2: Example of using technology in education



Source:https://elearningindustry.com/how-important-is-technology-in-todays-education-industry

[1] Lazar Stošić, THE IMPORTANCE OF EDUCATIONAL TECHNOLOGY IN TEACHING, (IJCRSEE) International Journal of Cognitive Research in Science, Engineering and Education Vol. 3, No.1, 2015, p 112.

Whose interest is educational technology serving? Who is included and who is not? Which is the problem to which technology claims to be a solution? How teachers and students engage/not engage with (open) digital practices, these are the main discussed questions. The use of electronic educational technologies in education is no longer optional nor an individual desire. Rather, it has become a necessity, especially after most schools have been trained on educational development programs based on the introduction of methods and means based on information technology as an essential element in teaching[1].

Today, teachers as a challenge must deal with new concepts and tools such as Technological Pedagogical and Content Knowledge (TPACK) which is a framework that outlines the different types of knowledge a teacher needs in order to successfully integrate technology into teaching. Before planning what technology to use and how it will be integrated into a course, there has to be a curriculum plan, which includes both Content and Pedagogy. This curriculum plan will encompass the teacher's philosophical outlook, disciplinary knowledge, how this knowledge is taught and assessed and who the students are (The students' experience of the implementation of the planned curriculum and the integration of technology).

2/2 Can technology replace teacher's role?: Teachers 'perspectives toward automation have generally been critical. Can modern technology replace teachers? Is the need of human teachers being eliminated? Other sensitive and complex debates: No need to papers and pens, as software can be used to write on, no to need physical books because of the advent of e-books and PDFs, individuals do not need a teacher because technology offers the alternative one. Technology can assist students in their learning and

[1] SafaSamih? EkrayyemAladwan, The use of educational technologies and modern electronic educational media in teaching science subject to grades (fourth, fifth and sixth) and their impact on the educational process from the viewpoint of teachers of government schools affiliated with the Jordanian Ministry of Education,Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 2): pp. 1254-1267 http://ilkogretim-online.org

play a crucial role in the field of education. The role of education technology is continuously expanding from projectors to smart boards and enabling better interaction between teachers and students in the classroom. For instance, using virtual reality transports students to ancient history. Artificial intelligence tools can also help make global classrooms available to everyone, including those who speak different languages, have visual or hearing impairments, or need to interact with resources at their own pace[2].

In the future, the teacher who does not use technology will be replaced by teachers who do or by technology itself. Technology will continue to replace teachers because of the poor quality control within educational systems and improvements in the way the internet stores, handles and distributes information. Moreover, many subjects can be learned for free by watching lectures delivered by legendary scholars[1].There are some who believe that teachers will be completely replaced by robots by the year 2027. One reason for this is that there is a demand for teachers today that is not being met.

It is true that it is a much known fact that in this modern age, technology is replacing almost everything. But technology cannot replace teacher; introducing new technologies will, however, replace some of the things that teachers do, and require that teachers take on new, often times more sophisticated, duties and responsibilities. Technology can do a number of teaching functions quite effectively, but this does not mean that it can replace the role of the teacher. Teachers help identify roadblocks for students that might be more personal or emotional in nature, that a machine cannot pick up on. They help to contextualize lessons in real time, which might not be possible for a piece of technology to do. All

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[2] Bernard Marr, Will Artificial Intelligence Replace Teachers? available at: https://bernardmarr.com/will-artificial-intelligence-replace-teachers/

[1] Why Technology Will Continue to Replace Teachers? Available at:https://phoenixite.com/why-technology-will-continue-to-replace-teachers/

need to stop telling public officials that education is cheap and we can fix it with machines.

A teacher is a person who is able to have a lifelong impact on the students. The teacher can scold, guide and understand a child's emotions as he/she is growing up. This can't be done by any virtual medium or by the Internet. There is a sensitive human side that technology cannot give. In this sphere, "Most people can look back at their own schooldays and identify teachers they thought were good. But generally they find it quite hard to say why certain teachers struck them as special. Perhaps it was because of their personality. Possibly it was because they had interesting things to say. Maybe the reason was that they looked as if they loved their job, or perhaps their interest in their students' progress was compelling. Sometimes, it seems, it was just because the teacher was a fascinating person!"[2]

3/**Educational Technology as a Economic Take-off keys:**

There are links between economic growth, technology, and education. Today an economy is more valuable not only when equal education and labor opportunities are available across gender, race, age, and ethnicities, yet it is more valuable when equal opportunities in using technology are available too. Education and learning now become one of the main factors that can decrease alienation and inequality. This will help in eradicating poverty, creating and accessing economic opportunities and at the same time sustainability and adaptation. These components are the key for success in economy knowledge and skills of workers. In this respects, these notions will supply business and economic growth.

The creation of digital opportunities within all sectors as a long term approach is essential for socio-economic development of

[2] Jeremy Harmer, How to Teach English, Sixth impression, Printed in China CTPSC/06, 2010, p23.

a country [1].The increasing sophistication of robots, artificial intelligence, big data and the Internet of things lead to the automation of existing jobs. Although it might seem to be part of the distant future, the number of robots, at least to take care of some tasks in certain industries, is already on the rise. Less than 40% of teachers report using technology for students' projects or class work, 20% in Finland and 10% in Japan, both PISA high-performing countries. Many students, particularly frequent users of social media, viewed social networking tools as "toys", and were not interested in using educationally useful social tools, such Delicious. The most popular app categories used by students on smart devices were for social networking, accessing music and gaming, showing that students may need to be made more aware of the educational potential of their devices. Indeed, both students and lecturers can be ambiguous about how to access information effectively, and how to select and contextualize digital technologies, often at a asic level. This means that students do not transfer the required digital literacy skills to use their devices for educational purposes.[2]

This is not to say that technology cannot support student's learning or add value to traditional instruction. For example, positive effects have been observed in using modern intelligent tutoring systems, i.e. adaptive one-on-one learning software mostly used for drill-and-practice. Nevertheless, as classrooms become more and more technology-rich environments, the way students

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[1]T.SUNDARARASAN, G.KALAIYARASAN , EDUCATION AND TECHNOLOGY AS A FACILITATOR OF SOCIO-ECONOMIC DEVELOPMENT, available at:https://www.researchgate.net/publication/333486050_EDUCATION_AND_TECH
NOLOGY_AS_A_FACILITATOR_OF_SOCIO-ECONOMIC_DEVELOPMENT#fullTextFileContent

[2] TRENDS IN EDUCATIONAL TECHNOLOGY available at:http://eprints.lse.ac.uk/55965/1/__lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_Centre%20for%20Learning%20Technology_Trends%20in%20Education%20Technology.pdf

learn and teachers teach could transform radically[1].The Digital Education Action Plan (2021-2027) as a renewed European Union (EU) policy initiative that sets out a common vision of high-quality, inclusive and accessible digital education in Europe, and aims to support the adaptation of the education and training systems of Member States to the digital age.

> Educational technologies are tools, not replacements. They are currently aiding teachers in their work, not completely taking over them. Technology can simplify the teacher's job**.** It will never replace great teachers, whereas, technology in the hands of a great teacher can be transformational. Student need teachers who know how to teach and are also capable with technology: Teacher can benefit from the use of technology in various way and at various levels and preserve the human aspect of education. One of the reasons that it is difficult to give general descriptions of good teachers is that different teachers are often successful in different ways. Some teachers are more extrovert or introvert than others, for example, and different teachers have different strengths and weaknesses. A lot will depend, too, on how students view individual teachers and here again, not all students will share the same opinions[2].

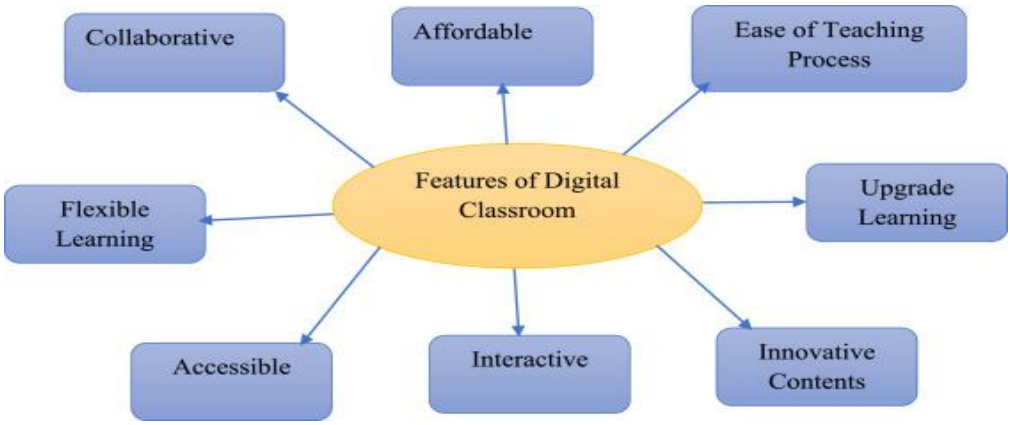
Digital technologies are a powerful instrument that can help improve education in various ways. However, These provide easy access to information, easy retention of information, increased storage of information, and improved
presentation of information; education became more interactive, easier sharing of knowledge and increased enthusiasm in learning, The digital classroom entirely focuses on teaching via the use of technology. Digital technologies through its features are a powerful instrument that can help improve education in various ways, such as making it easier for instructors to generate instructional materials

[1] A Brave New World: Technology &Education ,availab/le at: https://www.oecd.org/education/ceri/Spotlight-15-A-Brave-New-World-Technology-and-Education.pdf23/03/2023.

[2] [3]Jeremy Harmer, OPCIT.

and providing new methods for people to learn and collaborate (Figure 03 shows the features of digital classroom)[1].

Figure 03: features of digital classroom



Source: https://www.sciencedirect.com/science/article/pii/S2666412722000137

As we know; T.W. Schultz argued that investment in education explains growth and Gary Becker gave us the Human Capital Theory. There are two ways in which a country can grow: either catches up with the leading economies or it can be a leading economy itself .If education is an important contributor to technological capability and technical change in industry which is one of the main pillars of economic take-off, The Educational Technology will activate this take-off. Because a balanced education system promotes economic development, productivity, and generates individual income per capita.

[1]Abid Haleem and all, Understanding the role of digital technologies in education: A review, available at: https://www.researchgate.net/publication/360810919_Understanding_the_Role_of_Digital_Technologies_in_Education_A_review

Conclusion and recommendations:

To conclude, education is an important contributor to technological capability and technical change in industry which is one of the main pillars of economic take-off. Algeria and many under developing countries face huge challenges in maintaining their take-off, they must develop new efficiencies and new technologies, using technology in education will play a major role in this development.

Today, economic crisis offers an opportunity for education to redefine how we use technology for many aspects of teaching and learning by:

- improving teaching & learning through: equipping teachers with sound pedagogical and technological knowledge; supporting more personalized and engaging learning.
- .Building digital resilience through: developing digital competence ; using appropriate digital mediation strategies at home and school.
- Providing skills for the future through: developing the higher-order thinking and social and emotional skills that a digitalized and automated world requires.