

Technological innovation and education: a brief review of the literature

La innovación tecnológica y la educación: una breve revisión de la literatura

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ABSTRACT

Introduction: Education and technological progress is currently considered a learning resource within the educational field, the use of new technologies facilitates and strengthens the teaching and learning processes since it offers various virtual tools that allow strengthening knowledge, sharing ideas, form critical thinking, among others. **Objective:** Identify the important aspects of the use of new technologies in education and what is the effect it has on students. **Methodology:** A bibliographic review of different databases was carried out on articles based on the last 5 years, which were from reliable bibliographic sources such as Scielo, Elsevier, Pubmed, Google Scholar and Redalyc, which contain information about new technologies and the education. **Results:** The use of new technologies in educational systems help to obtain a greater development of the individual based on scientific knowledge, achieving the training of people with better skills and development capabilities thanks to the use of virtual tools. **Conclusion:** Technological innovation and its implementation in education improve the quality of teaching and self-learning since it provides various mechanisms of use such as virtual platforms, web pages with high academic impact, among others.

Palabras clave: education, technology, process, tool, implementation, services, evolution.

RESUMEN

Introducción: La educación y el avance tecnológico en la actualidad es considerado un recurso en el aprendizaje dentro del ámbito educativo, el uso de nuevas tecnologías facilita y fortalece los procesos de enseñanza y aprendizaje ya que ofrece diversas herramientas virtuales que permiten fortalecer conocimientos, compartir ideas, formar pensamiento crítico, entre otros. **Objetivo:** Identificar los aspectos importantes sobre el uso de las nuevas tecnologías en la educación y cuál es el efecto que tiene en los estudiantes. **Metodología:** Se realizó una revisión bibliográfica de bases de datos diferentes en artículos basados en los últimos 5 años, los cuales fueron de fuentes bibliográficas confiables como Scielo, Elsevier, Pubmed, Google académico y Redalyc, los cuales contengan información acerca de las nuevas tecnologías y la educación. **Resultados:** El uso de las nuevas tecnologías en los sistemas educativos ayudan a obtener un mayor desarrollo del individuo en base a conocimiento científico, logrando la formación de personas con mejores habilidades y capacidades de desenvolvimiento gracias al uso de las herramientas virtuales. **Conclusión:** La innovación tecnológica y su implementación en la educación mejora la calidad de enseñanza y autoaprendizaje puesto que aporta diversos mecanismos de uso como son las plataformas virtuales, páginas de web de alto impacto académico, entre otros.

Palavras-chave: educación, tecnología, proceso, herramienta, implementación, servicios, evolución.

INTRODUCTION

Today, there is recognition that mathematical science should be appreciated for the importance of the relationship Education has been able to reach important variations thanks to the use of didactic technology, which provides different resources and means for school guidance such as the use of virtual platforms, tablets, educational software and easily accessible digital books, evidencing a modern scientific culture of variety of programs and resources that currently exist, which help to enable teaching and access to education for pupils and educators who over time have acquired familiarity in conduct these tools. (Marín and others, 2020)

The use of new technologies has caused various variations in the day to day of civilization, especially in the field of work, fun, learning and in the way of thinking. The information and communication technologies play a very essential and significant role in the formation of society and culture, producing different changes and putting vested interests at risk when the technology fails or disappears for any given reason (power outage and internet , among others). (Cueva & Diego, 2020)

Commonly the matter of education and new technologies has an approach which pictures various didactic aspects being considered as a means and a reserve that teachers could count on, generally, the variations that this produces at the level are not evidenced in the world of the education of children and young people which, due to their education demands open the implementation of new technologies and technological enhancements available for the development of knowledge. (Palaces and others, 2021)

Education worldwide has had different evolutions in recent years due to the expansion of society and the implementation of new technologies that have been of interest to different cultures at a universal level, especially in the technical, scientific and professional fields, embracing a set of patterns and behaviors necessary to face the constant conversion for the instruction of human capacity, its improvement, progress and evolution that is expressed in the need for continuous learning study. (Dominguez, 2022)

The RAE (Royal Academy of Language) outlines innovation as the alteration of a product and its integration into the

market (Cueva & Diego, 2020). The words innovation and innovate are connected to the adjustment, creation, alteration and invention of a certain article or product, in such a way that it could be said that the modernization that education has had is a change that arises as a result of constant research, development and discovery which purpose is the growth of individuals thanks to the change in education. (Daisy and others, 2018)

Innovation is an progress whose main characteristic is to fulfil the desires of the human being. It is important to take into account that this depends on time, practice and the context in which it is introduced, in such a way that when technological innovations are introduced at the level of educational institutions (use of virtual platforms, educational software, etc.) They are reflected educational innovations according to the way in which they are going to be administered and the context in which they were presented. (Freixas and others, 2022)

A model of technological innovation in educational organizations is the use of online courses by platforms such as: Zoom, EdApp, Edvance360, Newrow, Google teams, among others. These platforms have been efficaciously applied in educational plans, handling to break both time and physical obstacles and thus provide more accessible education, making good use of new technologies and managing to endorse interpersonal communication to forge greater knowledge through exchange of thoughts and knowledge between people. (Aznar and others, 2018)

Innovation has a development procedure that are: innovation as a method of change, innovation as problem resolution and innovation as expansion. That is why it can be said that the innovations in the educational units are executed with the purpose of having a development or growth since this can make a modification in the entire internal area of the organization involving the progress of the dimensions of the students and generation of new knowledge. (Francis, 2018)

Technological knowledge has been studied since the 18th century. For economic expert, technological knowledge is crucial for the development of a civilization, especially in the acquisition of knowledge, economic growth and evolution. The evolutionary investigation allows individuals to explain how technological innovation has promoted society over the years, managing to gratify problems or needs of humanity. (Molina and others, 2022)

Education is contemplated an indispensable part which helps to integrate the community, culture and productive growth, which is why education is designated as an essential right of each person in the world, demanding the implementation of new systems of teaching that are reliable with the new data, content and practice that students require, providing information and preparing them for their future work. (Gunel, 2022)

The persistent technological advance and its application in education characterizes an occasion to consolidate educational systems since they help to impart and attain knowledge, in addition to helping the progress of students such as their personality, powers, needs and their ability to function in various conditions allowing to assess what is the result achieved through teaching and learning in virtual platforms. (Alexis, 2022)

Innovative technologies are refreshing as a group of products which are born from modern software and hardware tools which are supports for the creation of programs capable of storing, processing and allocating information as well as being collaborative and having great sound quality and video constituting the self-styled computer networks that help to offer users different opportunities of getting functional information on a large scale.

Education advances in prodigious steps thanks to technological advances, since it provides numerous services to both instructors and scholars in the field of educational expansion, since currently material technologies are used as a means or pedagogy tool, obtaining assertive results and having huge benefits in the educational field. (Cárdenas and others, 2022)

Currently, the learning system has been in constant evolution thanks to the changes that have arisen at the digitalization era. First, digitalization was incorporated into the community and into people's daily lives, to later be implemented in educational systems. ICTs are technological tools that help the educational process and that also become a basic instrument that must be implemented and developed in the education process. (Riaño and others, 2022)

With the integration of technological tools in teaching, more chances for educational access are created, which are very helpful and convenient for the student, in such a way that the suitable use by teachers helps to guarantee notable changes as a result of their analysis.

Now, the use of scientific equipment is being examined because it is contemplated that in some institutes teachers do not fully take benefit of the use of the assets provided by technological equipment, in such a way that these are unobserved or used occasionally, making the organization at the educational level decreases since there is still a large number of teachers with limited knowledge of the advantages that ICTs offer in the learning and teaching process. (Sergio and others, 2022). Others technologies such as metaverse tools educational environments are increasing the intensive innovation rhythm in actual education (Ordoñez Valencia et al, 2022).

Tech improvement, like any other invention, needs a complement to help to continue and spread in society, in such a way that it does not vanish, it is important that there is a complementarity among the desires of society and the benefits that

technology can offer, which results in the existence of evolutionary processes in terms of technological knowledge which will be developed and transmitted by society through learning tools.

Among the effects of technological evolution, the obtaining of knowledge and knowledge through investigative methods or, in turn, through informal methods stands out, since in this way the individual can self-orient himself in topics and even interfere and contribute to the knowledge of others by contributing a certain number of ideas acquired through the use of technological platforms and their desire to have individual learning, determining a higher rate of learning and evolution. (Gomez & Dominguez, 2022)

Technological innovation is significant reflecting the contribution that it offers to the development of learning acquired through precise and planned examinations, which are called investigation processes of the unidentified, in which self-learning actions are done in a competitive manner and often it is not intentional, if not rather it arises as a product of the need to search for data that is produced between people being part of the process that causes new understanding, and that this depends on the technique and approaches of production and information gathering.

Technological innovation is studied as several learning processes which are done through the use of technology, between which the so-called learning by doing can be emphasized, which is the process that happens during the manufacturing stage and after design of the product, while on the other hand there is the so-called learning by using, which is the one that is used once the final product is used by the user and has ideal implementation, leading to the influence of essential actions that represent technological innovation. (Rueda and others, 2021)

Technological innovation and its involvement to education results from a series of learning procedures which require the realization of a change in the educational procedure that individuals can obtain greater knowledge based on bibliographic investigation and the implementation of different procedures, ideas and skills that are essential to create knowledge, as well as the search for new ways to gain learning.

Technology requires three essential elements for its application, which are: the method, the means and the understanding. These elements are known as the technological capacities in innovation, these capacities can be modified or altered in order to carry out the research because they are complementary, being considered as one of the many resources that can be counted on to acquire the necessary information. (González & Herrero, 2019)

Technological instruction characterizes the connection that exists among technology and education which provides to the formation of thoughts based on facts and scientific knowledge, and which is focused on fulfilling the information needs that arise in the student. It is important to identify the assistances of technology in the field of education, as well as the use of technological organizations for the creation of educational systems with enhanced fallouts in terms of learning for children and individuals.

RESEARCH METHODS

To gather data, a bibliographical review of different databases was implemented on articles based on the last 5 years, which were from reliable bibliographic sources such as Scielo, Elsevier, Google Scholar and Redalyc. This revision was done based on the criteria for conducting qualitative research, selecting documents that include information about new technologies and education. Its objective is to recognize the important features of the use of new technologies in teaching and what is the effect it has on learners.

RESULTS AND DISCUSSION

Throughout history, educational technology has been studied as a important doctrine that has performed a leading role in the changes in the way educators teach, achieving a better way of understanding by students, since it achieves to produce various academic support tools and programs essential to achieve a complex learning, where technology regulates the variations that are going to be made in educational organizations for the implementation of information applications for student development. (Hecht & Larrazábal, 2018)

The matter of the use of new technologies and education has had a didactic approach, taking into reflection that it is one more method of the many that a teacher has to provide learning to children and young people, however, it is essential to be taken into account the favorable modifications produced by the use of technological advances at an official level, since they offers greater opportunities of access to education to people from different parts of the world, making them absorbed in obtaining knowledge and to a large extent done self-learning outside of educational establishments. (Paula, 2022)

It is important that students comprehend the use of technological tools in the educational field and the benefits that they provide in personal instruction, helping their development to be faster according to the development of technology and its application in the educational field since technology has been used for schooling, there have been great advances in students and teachers because it is a tool that helps and encourages learning. (Diaz and others, 2022)

Technological instruction has achieved to have a better proper in the didactic field, founding and controlling disciplinary tools that can be at the service of students and, in turn, generating endless educational proposals based on knowledge formation techniques and the preparation of information. primordial, which is the basis for the operation and understanding of current civilization, has also managed to form thoughts necessary to understand the differences between past civilizations and what was the contribution of technology to the development of new practical and theoretical aspects. (Rueda and others, 2021)

The knowledge instructed by teachers in educational institutes and the use of updated technologies have led to a better training of human beings, managing to increase their capability for individual, work, collective, family, academic development, among others. It could be said that technology is present in a large number of scenarios in which human beings cooperate, since it fluently influences and affects behavior, thoughts and even its nature. (Chen, 2022).

It is important to appreciate that education and technology do not have a relationship that only represents the use of laptops, as is generally assumed, but that technology contributes to the creation of scientific and technological sciences that generate involvement, knowledge, and critical thinking, mainly promoting the ability to invent and be creative both individually and collectively, and generate competitiveness, which will result in human development and in turn social growth that will favor society. (Capote, 2022).

When implementing the use of new technologies in the educational system not only helps to implement the use of accessible instruments that the teacher has to train children and young people, but also gives rise to a greater expansion of the human being in the which scientific and technological knowledge receive the significance that is required avoiding delineating the capacity of what a person is proficient of doing or not, taking into account the difference of technology for self-training. (Elosua, 2022)

The use of technology and technological improvements in education have been of unlimited help both in teacher training and in the results got when evaluating student understanding. The use of new technologies has developed an enhancement in educational skills and in the acquisition of knowledge, highlighting the importance of diverse educational resources such as videos or virtual programs and apps which help to strengthen learning. (Bernal & González, 2022)

The importance of using new technologies as pedagogical resources is based principally on the diminution of time to do activities, additionally, to allowed access to information and knowledge through platforms, web pages, forums, apps, among other types of resources, which carries the opportunity to generate growth in learning techniques and to integrate new tools for pedagogical practices that may be freely and openly available for the training of both teachers and students. (Barbosa and others, 2022)

Technological invention and education is connected to those new actions that have the objective of associating the development of educational institutes, since they help to solve problems and fulfill the requirements that arise in the educational atmosphere in order to develop the educational superiority of the institutes fulfilling an important role that is the materialization of residents with greater reasonable capacity and with greater knowledge, achieving an evolution of civilization and contributing to the social and economic well-being of the nation. (Mendoza, 2021).

CONCLUSIONS

Educational innovation is offered in various procedures and reveals itself in different fields, creating variations in teachers and students, focusing on the growth of each of the features of the educational organizations in order to pursue a improved expansion of the quality of instruction starting from the earlier variations in the educational systems of teachers as well as in the ways of acquiring of the students, thus succeeding an improvement in the instruction of learners.

The achievement of technological developments in the educational field is essential, subsequently the use of virtual programs, simulations, online laboratories and other technological assets provide greater access to knowledge, improving the practical capacities and knowledge of the individuals, endorsing research and self-learning emerging the ability to compete, strengths in students according to their abilities and contributing to both personal and professional growth.

The invention of technology has built great influences in educational systems since it is focused on the growth of learning and teaching, relating the teacher and the students since it conveys the completion of a new way of obtaining and sharing knowledge, handling to solve educational troubles and growing the malleability of society to new educational

procedures.

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