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New Teaching-Learning processes. Online teaching

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Abstract: *Nowadays, education is essential for any economic system because, on the one hand, through education, the relations between man and society become much more diverse, and on the other hand, today's society needs a well-educated workforce in the context of globalization. The educational offer of the universities must anticipate and respond to the needs of society and produce that mass of communicators and receivers that define an open society. This process involves research for developing and using new technologies and providing mechanisms for vocational training, business education and lifelong learning.*

This article aims to reflect on the possibilities and difficulties offered by digital technologies applied to the educational process. These theoretical reflections are based on the authors' teaching experiences during the pandemic.

Keywords: *Technology-mediated education, teaching-learning, online teaching, educational technology.*

Introduction. A New Scenario for Education?

What used to be synchronous and collective (cinema, family TV, face-to-face education, etc.) has become an individual and asynchronous practice (podcasts, tablets, computers, smartphones, streaming, platforms, digital networks, etc.).

The cyber world has been accelerated by the pandemic (covid-19), and this has strengthened, in this case, that concerns us, online teaching and has revealed its possibilities and limits (among others, digital gap, lack of digital empowerment, "attention theft", dependency, identity concealment, blind faith in technology, "data and surveillance capitalism", etc.). These technologies can make us stronger and more in times of pandemic, but also more vulnerable regarding information, etc.

Online teaching is transmitted and mediated by technology via the Internet, and students and teachers do not need to be present simultaneously and in the same place. Online learning practices are developed within the technological process in teaching-learning platforms and within pedagogical models. Through the network

of networks, the possibilities and modalities in learning have been expanded. According to A. M. Alonso, 2020, 235-236 and notes: 1) there is a face-to-face modality that has been developing in the classroom with conventional means and uses 2) a mixed face-to-face and non-face-to-face modality have been developed (*blended learning, b- blended*), and 3) a form of teaching-learning directly mediated by electronic technology (*e-learning*) has been incorporated, especially in times of pandemic. This teaching is done through a network of networks. Here the student's interactions with the material are mediated by computer tools. (In the network of networks, we have a technological structure (Internet), the level of the Web, the place of the Cloud and the practical applications known as App). (See the entire article by A. M. Alonso, 2020, where she states that online education poses new problems for the science of education, which has a dual nature: it is social science and science of the artificial since technological mediation reinforces the artificial dimension of the science of education. From a philosophical-methodological analysis of education mediated by technology, it contextualizes educational designs as scientific designs). The diagram in the following figure (1) shows the main factors involved in online teaching.

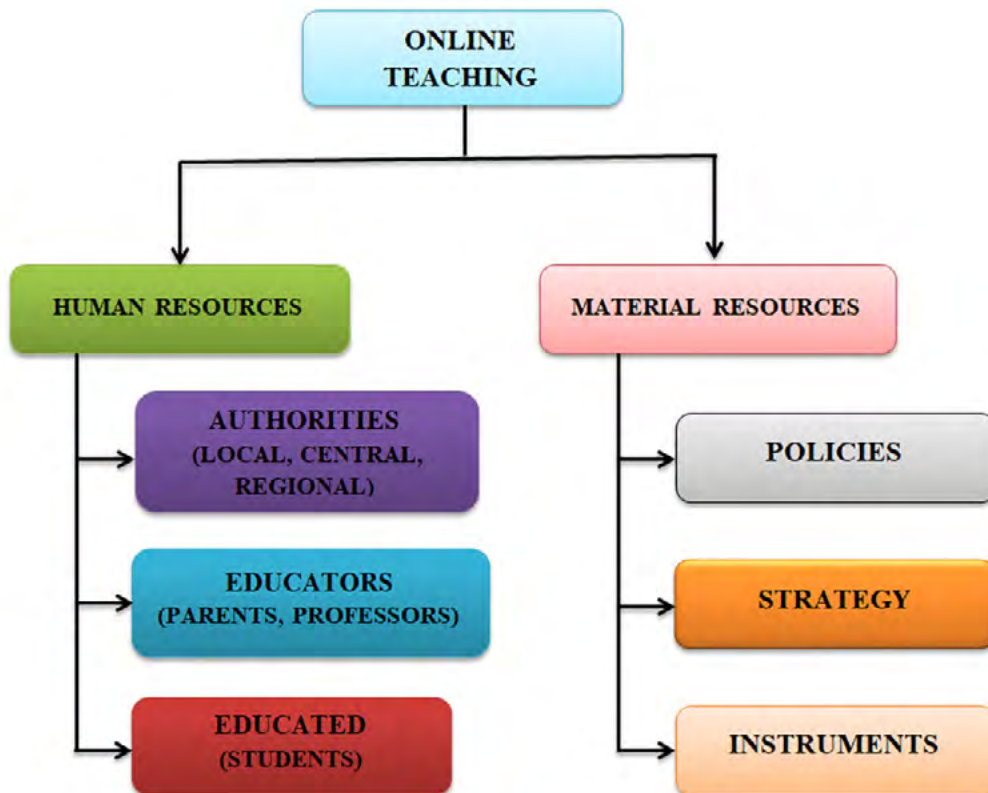


Figure 1. Factors involved in online teaching

Instruments/Tools:

- Devices (phone, tablet, computer, etc.);
- Internet connection;
- Educational platforms (Zoom, Classroom, etc.).

Authorities / Policies:

- Ensuring the legal framework for online teaching;
- Providing financial support for easier access to this type of education.

Strategy / Educators / Educated:

- Unconditional and equitable access to online education;
- Reducing the risk of dropping out of school;
- Ensuring a quality level of the online education process is at least equal to the face-to-face one;
- Redesigning curricula and teaching-learning-assessment methods;
- Ensuring digital skills and competencies for both educated and educators by setting up learning and digitization centres within higher education institutions;
- Optimizing the student-student and student-teacher interaction to obtain excellent learning outcomes.

We must also include Augmented Reality (AR: safety training, medical and engineering training, etc./VR: virtual field trips, language immersion, skills training, etc.) and Virtual Reality as technological instruments applied to education.

These technologies create new education means by opening doors for students to learn and teachers to instruct in a more immersive, technological environment.

From a reflexive-methodological approach, these technologies have promoted, sometimes by force due to the pandemic, very positive new teaching-learning modalities, but they also pose significant challenges. As stated by M. Boulahrouz, R. M. Medir, S. Calabuig i Serra, 2019, 89-90, an article on digital technologies and education for sustainable development, also applicable to our educational context, "despite technological advances and the incorporation of ICT in educational centres, the use made by teachers is of occasional users. ICTs are used for activities with a low cognitive level, such as searching for information or preparing tests and academic activities. On the one hand, they facilitate access to various educational materials (through distance learning, educational networks and databases). On the other hand, they help foster new forms of interactive learning that address issues and allow access to information and the transmission and exchange of knowledge using multiple means of communication. Technologies alone do not allow changing the dynamics of Educational Systems; changes in education will depend on the use of digital technologies. The didactic methodology is essential for incorporating ICT in the classroom. Digital technologies should favour critical-reflective capacity from activities requiring a high cognitive level such as authentic learning, creative thinking or problem solving".

E-Learning Timeline

Suppose a brief tour is made of the different moments that the evolution of Educational Technology has had until reaching E-Learning. In that case, we verify that we have passed since 1924 with the Pressey Testing Machine (Pressey's teaching machine), the first device related to education. With this machine, they presented educational materials to the students. His machine originally supplied multiple-choice questions. The machine could be set to advance only when the student got the correct answer. The tests showed that learning had taken place. This was an example of how knowledge of results causes learning. Today we have M-Learning (Mobile Learning).

M-Learning (mobile electronic learning) is called a teaching and learning methodology that facilitates the construction of knowledge, problem-solving and the development of diverse skills and abilities autonomously and ubiquitously, thanks to the mediation of portable mobile devices, such as mobile phones, PDA Personal Digital Assistant, tablets, Pocket PC, iPod and any device that has some form of wireless connectivity. It is e-learning (education and training via the Internet) on mobile devices. (See: <https://www.goconqr.com/dia-positivo/11324287/tecnologia-educativa-del-inicio-hasta-el-e-learning> (26.5.2022)).

Outstanding Features of Online Teaching

The most characteristic features of online teaching concerning regular teaching are, among others, the following factors that are indicated below:

- a) distance in interpersonal educational relationships,
- b) greater flexibility and autonomy of the students to develop and control the learning process, moving from mere teaching to the learning process.
- c) the interaction between people takes different forms, namely student-teacher (instructor), student-content, student-student, and student-interface (A. M. Alonso, 2020, 231-232; C. N. Gunawardena/M. S. McIsaac, 1996, a very comprehensive and complete article on distance education and with an extensive and handy bibliography).

These new technologies that help online teaching, in turn, are configuring a new virtual or digital space, something that is affecting the formation of new types of knowledge, producing a technification through knowledge (scientification), for example, of our profession and daily knowledge, even causing a technification of knowledge itself (computerization). Attempts are being made to use technology (Internet, computational intelligence, artificial intelligence) to optimize teaching-learning processes. There is no doubt that today machines are "learning" about users-people, based on the data they generate in this new learning process. Technology is no longer a mere support since it is conditioning the same online educational activity; namely, it is affecting, as stated by A. M. Alonso, 2020, 234-235, the central elements of educational activity: 1) the teaching models, 2) to the types of learning; 3) to the sources of information and knowledge, 4) to the cognitive processes

themselves, 5) to the educational institutions and organizations that have to adapt to the digitization and promote "digital literacy", since the processes are carried out on artificial platforms that require, in turn, capacities, skills or competencies learned merely instrumental.

The European Commission understands these capabilities, skills or competencies as follows: "Digital competence is the set of knowledge, skills, attitudes (including skills, strategies, values and awareness) that are required when using ICTs and digital media to perform tasks; solve problems; communicate; manage information; to collaborate; create and share content; and build knowledge in an effective, efficient, appropriate, critical, creative, autonomous, flexible, ethical, reflective way for work, leisure, participation, learning, socialization, consumption and empowerment." (A. Ferrari 2012, 3-4).

There is no doubt that this type of education mediated by technology constitutes an area of research, as many pedagogues affirm, interdisciplinary in which, in addition to the science of education, the Internet (in its scientific and technological dimension) intervenes, as we have seen) and artificial intelligence, which has a role in the different aspects of the network of networks and within the so-called "knowledge society", although our society is still more of an information society than a knowledge society.

In recent years in the debate on education and, in general, in society, considerable attention has been paid to knowledge. There is talk of the "knowledge society", which generates intellectual capital, of "knowledge companies or clusters", of "knowledge management", of "knowledge-based development instruments", etc. It is said that many jobs and even the economy require "intensive knowledge". The term knowledge has become something like a talisman that everyone uses, but few propose what they understand by that term or say what form or type of knowledge they speak or discuss. Our information and communication society is a knowledge-based and knowledge-intensive society. This knowledge that is being built in the era of new information and communication technologies, in which we generate information from data, which, in turn, can generate knowledge, which is the result and process of what we believe/value through experience and learning, communication, information and inference, differentiating between the information that circulates around us as a detached piece that only becomes knowledge when it has been assimilated, understood and situated in its context and knowledge, containing meaning conferred by human beings from what they have learned and internalized, which can have, according to the classical conception, three different forms, namely; a) scientific knowledge, based on justification; b) professional-practical knowledge, based on action and c) ethical-political knowledge, based on practical wisdom and ethics, or can encompass a great multiplicity of knowledge, which, as stated by H. Spinner, 1997, 505- 528, are of all kinds, of any quantity, of any quality, of any combination and of any representation. (See: N. Ursua, 2004; A. M. Rodríguez/F. Raso/J. Ruiz, 2019).

E-Learning is Technology-Mediated Teaching and What It Should Be

We share the ideas with our university colleague Carlos Castaño, a specialist in the area of Educational Technology and New Technologies applied to education, who, throughout this process of education mediated by technology, -which is friendly and allows many things to be done with good parameters of quality and reliability - critical variables are being forgotten. We are focusing too much on the technology itself. "We are doing the same as before, but with other ICTs". (https://docs.google.com/presentation/d/1UK9IaRPXGRneJRq9wb_WBCg9u_PCMao7aEM8cyZtXtg/pub?start=true&loop=false&delayms=5000&slide=id.p4 (27.5.2022)).

The solution, says this expert, comes from something other than technology but pedagogy. We do not have to focus on the technological variables but on the didactic, organizational and pedagogical variables. Unfortunately, we do not have suitable materials either.

According to our experts, the future of education is not a digital replica of a classroom. "The change in the way of creating, sharing and distributing information can be the basis for creating new innovative learning structures". (C. Castaño: SENLAT, 5.24.2021). We cannot forget that in this entire teaching-learning process, the most important thing is people. The authors agree on a few things, but if they agree on something, it is that people have different learning needs and learn at different rates. However, as A. M. Alonso writes, 2020, 235, note 8: "schools and training programs, in general, teach a fixed and predetermined amount of content, in a specific pre-established time interval. Planning the development of teaching so that each student progresses in learning at the rate at which they reach a certain level of achievement requires the application of a didactic methodology that the Internet allows optimization.

Complex Teaching-Learning Models

It is worth noting at this point that Allan Carrington's Wheel of Pedagogy, which is very interesting as a conceptual instrument, is not something mechanical and is based on B. Bloom's categorical taxonomy ("remember, understand, apply, analyze, evaluate, create"); this is a hierarchical model for organizing, planning and evaluating teaching).

This pedagogical wheel is read from the centre outwards and clockwise. It goes from the simplest to the most complex. The first circle refers to the attributes and capacities/competencies of the graduate; the second circle has words that refer to the activity of any competent professional; the third indicates the categories of the conceptual domain of Bloom's taxonomy (indicated above), the fourth shows the active verbs, suggested for each domain, the fifth gives ideas about what activities we can design so that the student demonstrates what they are supposed to know at the end of the lesson, they are therefore activities to evaluate, the sixth circle contains the Apps for carrying out the activities of the fifth circle in digital environments. (See:

https://designingoutcomes.com/assets/PadWheelV5/PW_ENG_V5.0_Android_SCREEN.pdf. Excellent explanation by Carlos Castaño: <https://www.youtube.com/watch?v=RJDoyDD1ebs&t=28s> (27.5.2022).

App Selection Criteria

Remembering Criteria: Apps that fit into the "remembering" stage improve the user's ability to define terms, identify facts, and recall and locate information. Many educational apps fall into the "remembering" phase of learning. They ask users to select an answer out of a line up, find matches, and sequence content or input answers

Understanding Criteria: Apps that fit into this "understanding" stage provide opportunities for students to explain ideas or concepts. Understanding apps step away from the selection of a "right" answer and introduce a more open-ended format for students to summarise content and translate meaning

Applying Criteria: Apps that fit into the applying stage provide opportunities for students to demonstrate their ability to experiment learned procedures and methods. They also highlight the ability to apply concepts in unfamiliar circumstances.

Analysing Criteria: Apps that fit into the "analysing" stage improve the user's ability to differentiate between the relevant and irrelevant, determine relationships, and recognise the organisation of content.

Evaluating Criteria: Apps that fit into the "evaluating" stage improve the user's ability to judge material or methods based on criteria set by themselves or external sources. They help students judge content reliability, accuracy, quality, effectiveness, and reach informed decisions.

Creating: Apps that fit into the "creating" stage provide opportunities for students generate ideas, design plans, and produce products.

The Pedagogy Wheel First Language Project

25 languages are planned for 2016. For the latest languages see, bit.ly/languageproject

Standing on the Shoulders of Giants

This taxonomy wheel, without the apps, was first discovered at Paul Reardon's educational consultancy website www.reardon.org.au. That wheel was produced by Sharon Arvey and was an adaptation of Kuhlthau and Anderson's (2001) adaptation of Bloom (1956). The idea to further adapt it to the iPad in V5.0 and V5.1, is to acknowledge Kathy Schrock on her website www.kathyschrock.com. In V5.0 the App Selection Criteria is based on an excellent www.kathyschrock.com www.kathyschrock.com by Diane Dierker. V5.0 of the Pedagogy Wheel has a comprehensive set of Action Verbs which are from the pedagogic "Bloom's Digital Taxonomy Vector" published by www.bloomstaxonomy.com. It is first viewed at "Bloom's Digital Taxonomy" www.bloomstaxonomy.com for "21st Century's Student" on the TeachThought blog.

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The Pedagogy Wheel by Alan Carrington is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Based on a work at <http://bit.ly/pedagogywheel>

The Pedagogy Wheel ENG V5.0 Android
<http://bit.ly/PWENGV5>

The Apple iOS version can be downloaded from the "In Support of Excellence" website linked above

Getting the best use out of the Pedagogy Wheel

Use it as a series of prompts or interconnected gears to check your learning from planning to implementation

The Attributes Gear: This is the core of learning design. You must constantly remind things like ethics, responsibility and citizenship. Ask yourself the question what will a graduate from this learning experience "look like" (ie what it is that makes others see them as successful? Ask how does everything I do support these attributes and capabilities?

The Motivation Gear: Ask yourself? How does everything I build and teach give the learner autonomy, mastery and purpose?

The Bloom Gear: Helps you design learning objectives that achieve higher order thinking. Try to get at least one learning objective from each category. Only after this are you ready for technology enhancement.

The Technology Gear: Ask How can this same pedagogy? Apps are only suggestions, not for better ones & combine more than one in a learning sequence.

The SAMR Model Gear: This is "How are you going to use the technologies you have chosen?"

I would like to thank www.reardon.org.au for the idea of the gears.
Alan Carrington

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Please visit the [CRIEDIES](http://www.criedies.com) website for more resources in Spanish

For the best use of the Pedagogy Wheel Model please visit the TeachThought Blog Post "The Pedagogy Wheel - it's Not About The Apps, it's About The Pedagogy"
<http://bit.ly/aboutpedagogy>

This SAMR model means S, Substitute, where ICT acts as a direct substitute tool, without functional change; A, increase, ICTs act as a direct substitute tool, but with functional improvement; M, improve, ICTs allow a significant redesign of learning activities; R, redefine, ICTs allow the creation of new learning activities, previously inconceivable.

This model creates a learning environment, improves the methodology and the products and helps to be creative, but we must always bear in mind that it is the students who have to learn.

Conclusions

Globalization, the process of integrating global realities and growing interaction and interdependence between the parts of the world (R. Casadei, 2005, p.27), has generated. It will continue to generate different reactions worldwide.

The rapid spread of the Sars - COV 2 virus (*severe acute respiratory syndrome*) has caused many victims (6,323,286 deaths, INSPR, June 8, 2022, <https://www.cnscbt.ro/index.php/situatia-la-nivel-global-actualizata-zilnic/3210-situatie-infectii-coronavirus-covid-19-08-06-2022/file>), as well as an emergency in the world's

educational systems, highlighting many weaknesses of these systems such as, for example, lack of resources for the digitization of education, lack of skills and digital competences of the actors involved, etc.).

In this context, the responses of countries or regions to the challenges of the knowledge-based society have caused radical transformations in the education system.

Therefore, the first action was to find a way to replace the face-to-face teaching-learning-assessment process without causing significant educational disturbances and compromising quality.

The solution that was easily approached but that involved massive movements of both material and human resources. ~~was online education.~~

Online education involves addressing the following challenges by the actors involved:

- Lack of learning resources (devices, internet connection, virtual classrooms, digital platforms, etc.);
- Lack of digital competencies and skills of the educated and educators;
- Inequity in access to online learning;
- Lower quality of online education than face-to-face education (lack of examples, face-to-face discussions, etc.).

Currently, many educational institutions have solved the problems (challenges) mentioned above through a massive involvement of resources in a short time, approaching online education as an alternative to face-to-face education rather than as a substitute for the same.

Many institutions needed to be technologically well equipped, and involving the faculty members in the best online educational practices was necessary.

As affirmed by A. M. Alonso, 2020, 256, putting technology at the service of education requires at least two aspects, namely, a rational deliberation about the purposes and using the knowledge that current science provides us about learning to identify what education needs from technology to achieve those ends.

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