

Teaching methodologies in times of pandemic

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Abstract: The current times call for reforms in educational processes. The Covid-19 pandemic had an unforeseen impact on the educational system in all countries. This need for change requires new pedagogies and new methods for teaching and learning. Understanding the need for change is essential for the formulation of adaptive proposals, as well as for the generation of training activities to complement the teaching curriculum. New educational practices lead to a vision of educational quality, with new approaches that allow the continuous integration of knowledge and permanent interaction with the student. This paper presents an analysis of the new teaching methodologies in times of confinement due to the pandemic caused by Covid-19

Keywords: Teaching methodologies, educational system, learning process.

Metodologías de enseñanza en tiempos de pandemia

Resumen: Los tiempos actuales exigen reformas en los procesos educativos. La pandemia por Covid-19 impactó de forma imprevista al sistema educativo en todos los países. Esta necesidad de cambio requiere de nuevas pedagogías y nuevos métodos para la enseñanza y el aprendizaje. Comprender la necesidad de cambio es indispensable para la formulación de propuestas adaptativas, así como para la generación de actividades de formación que complementen el currículo docente. Las nuevas prácticas educativas conducen a una visión de la calidad educativa, con nuevos enfoques que permitan la integración continua de conocimiento y la interacción permanente con el estudiante. En este trabajo se presenta un análisis de las nuevas metodologías de enseñanza en los tiempos de confinamiento por la pandemia ocasionado por la Covid-19.

Palabras Clave: Metodologías de enseñanza, sistema educativo, proceso de aprendizaje.



I. INTRODUCTION

Teaching-learning methodologies function as a set of methods, techniques and procedures whose ultimate purpose is to ensure that the skills and knowledge that comprise a given field of knowledge can be transmitted correctly and efficiently to those individuals who require such skills or knowledge [1]. It also includes those individuals who, being immersed in an educational system, go through a defined training path. As the years have passed and as new scientific discoveries have provided novel approaches to how individuals learn and in what ways they assimilate amounts of information that, once organized, can describe a set of skills and knowledge, existing methodologies have adopted and integrated those parts that work best into their teaching models.

Education goes through transitions of different categories, which are immersed in an empirical, real and current social reality [2]. The digital environment is an emerging situation that involves changes in discourse, perception of processes, scope and methodologies for teaching practice.

This paper shows a bibliographic analysis of teaching methodologies in times of pandemic, where the school has had to reinvent itself to propose new learning scenarios, and it is essential to formulate new teaching processes for educational didactics in all academic areas.

The first section describes the fundamental aspects of the research, the second section presents the theoretical foundations that reinforce this study, then the methodology is presented, and finally the results and conclusions.

II. DEVELOPMENT

Teaching-learning methodologies are made up of a whole tree of elements that point, without mentioning it directly, to the different types of individuals and their characteristics and how to provide them with knowledge and skills. (Fig.1).

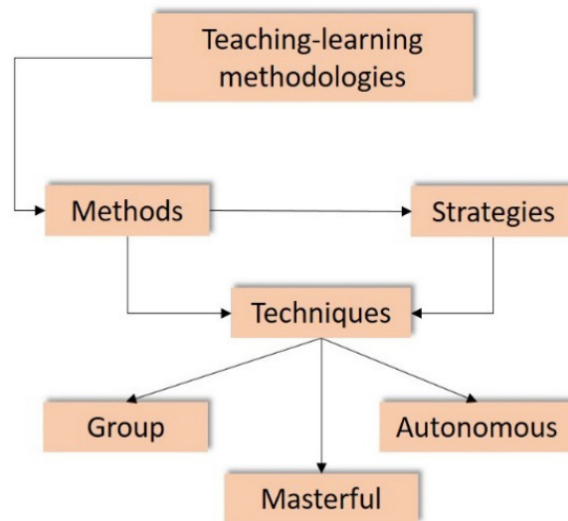


Fig.1. Teaching-learning methodologies.

But no methodology can be appropriate if teacher training is not considered an indispensable tool for improving performance [3]. Teacher performance should be directed towards educational quality, and training strategies should be aimed at continuous teacher improvement, from the human and social perspective, to the academic and professional.

As is logical to expect, not all methodologies are adapted to the use of certain strategies, methods or techniques. This paper attempts to clarify which methodologies are more likely to use which resources, which strategies and which type of methods in the achievement of the objective, and to propose new approaches that nurture the objective of training individuals with adequate criteria in the exercise of knowledge.

A.Scope and limitations of the Victorian model

According to Torres[4] education considered as classical or systemic [5], which is the basis of the traditional education system, having its origins in the European industrial revolution of the mid-eighteenth century, focused on a certain set of political, economic and social needs that were very relevant for the time: specialized labor was required, who knew how certain operations worked and how to manipulate them. This somehow allowed industrialization to be sustained over time and as science advanced, so did industrial progress.

In this context, the educational process was centered on the figure of the teacher as an agent transmitting knowledge to a lay audience, creating a unidirectional radio system in the acquisition of knowledge, where the teacher imparts and the student tries to grasp the message, being evaluated mainly on an individual basis, giving him a set of general problems to solve as a measuring mechanism in his task of successfully achieving the required knowledge. This method is called passive since the individual does not question what is taught and does not need, at least not at the time the subject is taught, to know why things work the way they do or why he should learn that and not something else. Paradoxically, it has been concluded that this method is ineffective for teaching science. [6].

B.Problem-based learning

It originated at McMaster University in the 1960-70s in the medical school [7]. With this methodology, the path towards a learning more focused on the student than on the teacher begins, where the linearity of knowledge transmission is modified to a cyclical process in which students overcome stages towards an increasingly complex learning [8]. The problem-based learning methodology enhances the procedures that allow the assimilation of knowledge that are used daily by people, since these are the ones that have been identified as the most effective [9]. These can be summarized as follows: a) The reflective stage on a problem, where the parts of the problem that the individual does not know are identified; b) The approach to the problem with the support of resources that allow the individual to identify how to solve the problematic elements; c) Application of the acquired knowledge and concretion of the solution and, finally, d) Analysis of the solution and its process.

Other teaching methods involve the use of ICT tools for their application [10], [11], [12]. Among these we include competency-based learning, the purpose of which is to validate through various procedures that the individual really masters the knowledge learned. This approach was initially very controversial because of its clear functionalist inclination and was considered inadequate as a methodology. Subsequent reviews were able to demonstrate that using this approach, taking advantage of certain strategies, could be positive in many social and educational environments. We can see how competency-based learning seeks to train people with direct skills, such as the practical mastery of knowledge, as well as transversal skills that refer to its consequences.

In the current situation of an increasingly demanding and changing world, the individual must not only learn but, as indicated by [13] and [14], must learn how to learn. To achieve this, the educational approach must ensure that the student can understand how his environment and himself function; the relationships that condition various interactions, whether natural, economic, social, etc. In other words, a multidisciplinary approach to knowledge [15], [16], [17]. This type of learning seeks that students build from reality a real learning of specific and general skills and abilities, instead of starting from the theoretical models of traditional approaches.

Other methods based on the use of video games have contributed significantly to teaching [12], and through them it has been possible to demonstrate that art and culture are influential factors in learning.

C.The flipped classroom

The teaching methodology that uses the flipped classroom dates back to 2007 and was created by professors Aaron Sams and Jonathan Bergman. They observed that more time could be invested in the practice and application of content if students accessed online study resources from their homes and then brought their doubts to the classroom so that, among the interaction of everyone in class, they could clarify their doubts [18]. Some authors [19] affirm that moving the learning space from a collective environment, such as a classroom, to a space where the individual student can access learning resources developed for their assimilation, allows the classroom to become a dynamic space for multidirectional exchange where the teacher clarifies doubts and guides students to the creative discovery of knowledge.

D.Cooperative learning

Cooperative learning is based on the interaction of small groups of students whose objective is to achieve goals collectively. To this end, members must develop their communication and teamwork skills. According to Domingo [15], this dynamic allows students to achieve significant learning and also to add values that can be expressed orally or in writing; it also enables them to structure ideas while instilling criteria for disseminating, defending and, if necessary, adapting them.

E.Gamification

The learning methodology through gamification implements the dynamics and characteristics of games and video games in educational contexts, with the aim of motivating students in their own process [18]. Mechanical games such as video games work with an elementary logic: obtaining rewards, these can have different types and levels and in a psychological aspect creates satisfaction and engagement as the person achieves objectives. When studying the structure of a game, it can be observed that they develop through their playful character, motivation in the achievement of objectives, commitment in the game system and desire to improve.

F.Design thinking

The Design Thinking methodology is defined as a process that combines the analysis of real problems from a creative perspective, the objective is to generate ideas taking as a reference the needs of an end user, creating prototypes that go through a redesign process until a finished product is achieved. This approach allows experimentation processes, identifying problems and associated needs and offering satisfactory solutions to them [20].

Empathizing: In this phase students seek to observe the human side of the problem; in this phase they think of people first, connect at a deep level with the problem to be solved by listening to what they have to say, identifying needs and revealing unexplored approaches to them.

Define: We seek to find patterns of reference common to the users, broadening the vision of the general problem picture to identify in what way the students can obtain a path of integration of the perceptions and needs to be solved.

Ideate: this is when, after listening to opinions, behavioral styles and particular tastes of the users. Students begin to think about the design that responds to the solution of the identified problem(s), contributing in those aspects of the problem with which they feel more confident to offer a solution, integrating group skills according to the objective set.

Prototyping: at this stage, the creation of the product or solution obtained is considered, which implies making it a tangible reality to be able to show it and socialize it.

Evaluate: Testing of the prototype solution in the real scenario is performed; it is usually required to perform continuous iterations until a final product is obtained.

III.METHODOLOGY

This paper evaluates several proposals of teaching methodologies mostly used in times of pandemic. Undoubtedly, the manifestations of Sars-CoV-2 have produced an important change in education, which already demanded new methodologies for the new times and the new generations of children of the technological era.

The selection of the reviewed works was limited to the use of articles published in Scopus, where the impact factor is high and the year of publication is 2020-2021. This was in order to incorporate recent and updated information that would make a significant contribution to this research.

The studies revealed that there is an important use of ICT tools in education, and that these tools provide support to teaching techniques and methods. Even more so in times of pandemic, where the use of digital platforms and web tools for education has increased.

IV.Results

The results show that technological tools are indispensable for new teaching methodologies, but even so, education cannot be separated from teacher participation and links with students.

Educational platforms must include the possibility of interaction with students and must incorporate tools that allow for diversity of methodologies, avoiding the repetitive use of teaching processes and methods.

Figure 2 shows a variant between the use of ICT tools and the incorporation of such tools, where it can be seen

that the incorporation involves a change in teaching and learning methodologies, and that they must go hand in hand with the proper administration of time, new academic spaces and the optimal use of resources.

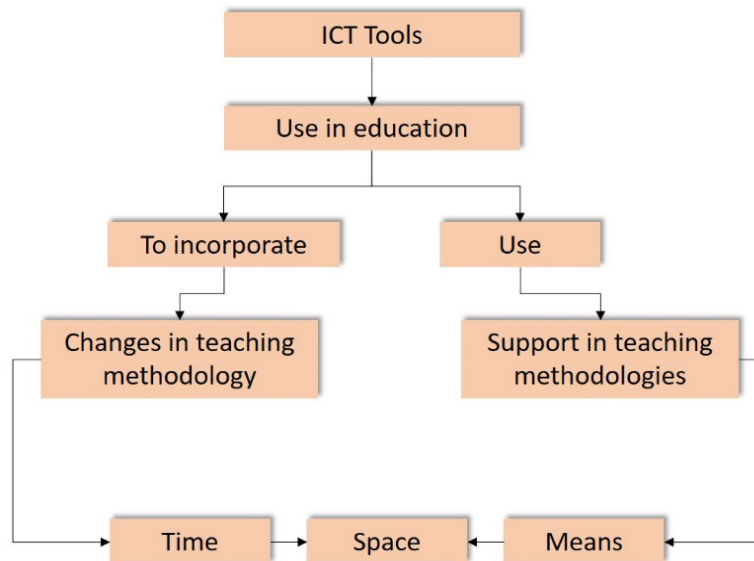


Fig. 2. Use of ICT tools in education

It was observed that ICT tools are linked to the teaching methodologies with some fundamental elements [20]:
 Work tools for teachers and students: that facilitate and integrate the search for academic activities and tutorials.
 Cognitive instruments: which include tools for the development of activities.

Didactic means: that facilitate the learning of knowledge, including tools for problem solving.

Teaching center management: which facilitates teaching administrative activities, file management, academic records, tutoring follow-up, among others.

Interaction with users: allowing communication with parents, e-mails, communication with other educational units or related entities.

V.CONCLUSIONS

Having completed a brief literature review on teaching methodologies in times of pandemic, it is possible to conclude the following:

1.Modern times demand new teaching techniques, which are not necessarily linked to pandemic situations, but are necessary to improve the academic profile, create more adaptive professionals and with new world views.

2.Pandemic times have increased the use of technological tools, but if they are not incorporated into the curriculum with changes in teaching methodologies, they will not provide the necessary results, but will behave as necessary tools, but not as tools that transform learning.

3.ICT tools that are misused will not be a contribution to teaching, but rather will be counterproductive to it, and could significantly improve the quality of education.

4.Using ICT tools incorporated into academic and didactic methodologies can mean an important advance in education, and in turn, a significant growth in teaching and learning.

5. Educational centers that do not incorporate ICT tools in their teaching processes will be left behind in the growth and new developments in education, and the academic profile of their graduates will be at a disadvantage with other more updated centers.

6.Teacher training in teaching methodologies is essential for the correct use of ICT tools.

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