CHAPTER 21

Virtual teaching, a global educational need

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ABSTRACT
With the arrival of COVID-19, the world suffered unexpected impacts. It forced countries to make accelerated changes in different aspects; of course, education was affected too. On this latter point, UNESCO reveals that approximately 94% of students in the world were harmed by the suspension of face-to-face classes. To counteract the effect of this conjuncture, the education sector implemented virtual teaching through existing technological tools. The speed with which the educational system had to adapt to this modality raised questions about the management and functionality of virtuality in education.
The purpose of this document is to analyze the need of adopting virtual teaching with the change of pedagogical strategies and to evaluate the digital skills that teachers need to adapt to virtual education, taking advantage of technological resources for the motivation of the student and their access to education. The descriptive method of documentary type and the analysis of the contents were used to process the information. Finally, we conclude on the importance of teaching work that, with a positive attitude towards technology, this has to rethink its role as a facilitator of the educational process and the fundamentals of the appropriation of digital tools.

Keywords: Virtual teaching, Pedagogical strategies, Peaching digital skills.

1 INTRODUCTION

The sudden appearance of COVID-19 brought as a consequence very difficult times for all countries worldwide and education was no exception; all educational management bodies were forced to close their doors and suspend face-to-face academic activities as a preventive and sanitary measure to avoid the spread of the pandemic (Valero-Cedeño et al., 2020). However, these provisions had a direct impact on the education sector and especially on students. Data from UNESCO (2020) reveal that 1.6 billion students at different educational levels around the world were affected by the suspension of face-to-face academic work, a figure that represents 94% of the total global student population. Likewise, in Peru, according to the Ombudsman's Office (2020), more than 8 million students were affected in their studies due to the health crisis.

Given the complexity of this context and education being a fundamental right of every human being, it has to be guaranteed and prioritized by the State (Amuchástegui et al., 2017); in view of this primary need, virtual education was implemented as a relevant alternative for the continuity of the educational service (Castillo and Cabrera, 2021), using and modifying its structure, generating new learning scenarios

(Valero-Cedeño et al., 2020; Crisol-Moya et al., 2020; Basantes et al., 2018; Cabrera, 2019) likewise, making use of digitalization as a powerful, present and future strategy (Ahmadi and Nourabadi, 2020; Gil et al., 2020).

Undoubtedly, the pandemic by COVID-19 represented the breaking point for the implementation of virtuality in the educational system, since being a primary pillar of our society, it had to adopt in a very accelerated way the digital culture as a fundamental part of its structure (Martínez-Garcés and Garcés-Fuenmayor, 2020), to adapt and respond assertively to a globalized community in technology and digital information in record time (Cabrera, 2019).

On the other hand, Ojeda-Beltrán et al., (2020) and Arango et al., (2020), refer that depending on the level of digital skills and the impression they get from the digital tools for their learning, students will be able to value their contribution or difficulty of the learning they receive in the virtual modality. Under this premise, teacher training processes have to focus on the management of technological tools, being necessary to create optimal pedagogical strategies for educators to interact with learners (Mahdiuon et al., 2017; García-Chitiva, 2020).

In that line, Basantes et al., (2018) point out that, we are facing a situation of parallelism of attitudes towards technology. We identify students, who have a technological lifestyle, as digital natives; while teachers are considered people who immigrate to the digital, so that appropriating technology will demand an extra effort to develop teaching-learning strategies in their different contexts. This is how students and teachers assume their new digital role in the pedagogical journey (Valero-Cedeño et al., 2020). In addition, Crisol-Moya et al., (2020) consider the importance of personalized teaching through unlimited connectivity strengthened with coexistence in the network for bidirectionality of information, digital interaction should be given to all equally, providing a virtual educational space where technology joins pedagogy to achieve the standard of quality in educational development. To this end, it is essential to take into account some basic conditions for its application such as the home study space; connectivity availability, technological academic support, syllabi adapted to the new virtual teaching and the digital competences of teachers and students (Aquino-Canchari and Medina-Quispe, 2020).

In view of the above, the purpose of this article is to review and analyze the existing literature on the need to adopt virtual teaching with the consequent change in the teacher's pedagogical strategies based on virtuality and to examine the new skills or competencies that teachers must develop to maintain the teaching standard to which their students were accustomed; it is also important to evaluate the change in the dynamics of communication and teacher-student interaction in this new teaching space called virtual classroom, to determine the new role that virtual teaching represents in the life of any student.

In order to achieve this objective, we consider it convenient to pose the following research questions:

What is understood by virtual education?

What changes have pedagogical strategies undergone in virtual education?

What competencies should teachers develop for effective virtual teaching?

2 METHODOLOGICAL STRATEGIES OR MATERIALS OR METHODS

Taking into account what Reyes (2020) mentions, a review article is a retrospective evaluation of the collection of research studies on a topic of valuable interest for the general public or a specialized one. It seeks to find the truth, the extent of the sources examined, the expertise of authors on the subject under review and the pertinent recommendations for the environment in which they will be applied. We can see that it is a review to which we must give due attention from its planning and subsequent evaluation. Likewise, Gómez-Luna et al. (2014) define it as "The literature review or state of the art corresponds to the detailed description of a certain topic or technology" (p. 1) and also states that "A literature search should be done from a structured and professional perspective" (p. 2).

The search for information is an activity as old as man himself, nowadays there is a lot of information on the networks, so it is necessary and essential to use search systems that are very efficient (Codina, 2018). In this research path that begins with the planning phase, Reyes (2020) refers that the authors determine their primary sources in their review: the databases they consulted, the "search engines" or "key terms" used, the selection criteria: inclusion and exclusion, the languages in which they were published, the stage of time to which their review was limited. All this will result in a pertinent evaluation phase with expected results.

For the above mentioned, for the preparation of this article, bibliographic searches were conducted by exploring scientific articles related to the following keywords: "virtual teaching", "pedagogical strategies", "digital teaching competencies", "virtual education", "virtual education", "virtual education", taking as reference the nationally and internationally recognized databases such as Google Scholar, Dialnet, Scielo, Scopus, Ebsco.

The bibliographic manager Mendeley was used to organize the information, which allowed the storage of the information in a virtual library and facilitated the writing of citations and bibliographic references following the APA norms.

The process began with the planning phase, where the objectives of the research were defined, to then determine the databases to be used and a bibliographic manager for the citations and references based on the APA norms, the strategies for the literature search were defined, using the above-mentioned search engines and taking into account the inclusion and exclusion criteria. The inclusion criteria were defined as follows: 1) Articles that were published between the years 2017- 2021, 2) Articles published in English and Spanish, 3) Articles published in congresses, 4) Open access articles. The exclusion criteria defined were: 1) Articles published in languages other than English and Spanish, 2) Articles published until 2016, 3) Articles that are not open access, 4) Articles that have no relation with the study variable, 5) Theses.

Subsequently, the evaluation phase was carried out by searching the information in the aforementioned databases, selecting the articles that adapted to the proposed criteria and filtering those

articles according to the exclusion criteria. Out of 120 articles reviewed, 46 articles were selected, that is, 38.3% that met the inclusion criteria. In addition, a detailed review process of the titles, summaries and conclusions of the selected bibliographic reviews was implemented, as well as a thorough analysis to extract the relevant information from the results, which will help us to answer the research questions initially posed.

3 RESULTS AND DISCUSSION

3.1 VIRTUAL TEACHING

Nowadays, the virtual teaching modality has increased its popularity because it uses the Internet and other technological tools as a means of transmission of educational content, offering multiple benefits for all actors in the educational process. In the current learning scenarios educational technologies predominate, education is dependent on virtual teaching, and allows better results in the educational process, so we have that, virtual teaching not only makes use of technology, but depends completely on it, making the Internet its indispensable channel (Fajardo and Cervantes, 2020).

Therefore, from the definition of virtual education, Tabatabai (2020) considers it as the transmission of pedagogical contents, without interferences of distance or temporality, through the different technological resources used in the communication of the teacher-discussant duo; an opinion shared by Expósito and Marsollier (2020), who add that virtual education establishes a different scenario for teacher-discussant communication, in addition, the use of technological resources originates novel ways of application and interrelation according to each context. Tabatabai (2020) considers new educational technologies based on simulation, which are managed from software and hardware, ensuring the potential of virtual education. Perissé (2020) states that the virtualization imposed by the health crisis, marked the accelerated development of the digital era. In this regard Pomar and Rivero (2020) argue that virtuality has managed to sustain the educational process of students synchronously and asynchronously, using the few technological tools that they knew and that initially have given positive effects, but that digital competencies need to be strengthened to improve educational quality. This idea coincides with Ayala and Drozinsky (2020) who also highlight the benefits achieved so far under this system. For Gil et al. (2020), properly executed virtual education can successfully replace face-to-face education in times of crisis, but also recognizes the vulnerability due to the change that arose when abruptly migrating to virtuality, which emphasizes the inequality of opportunities and community responsibility. Varguillas and Bravo (2020) agree that the benefits of virtuality, including from a humanistic perspective, are valued by students because it facilitates access to educational innovation and incorporates the use of ICTs for comprehensive learning. From this point of view, virtual teaching is more than valuable praxis spaces and laboratories that enhance their academic performance; it is a profound triad of education, communication and technology used to teach. Llorens et al., (2021) consider the importance of the use of ICT in this era of knowledge, being an essential part of the reform of educational methods that society needs to evolve; therefore, teachers must implement a paradigm shift from traditional education (Domínguez et al., 2017).

Puerta et al., (2020) state that virtuality is a way to attract the learner to education, or bring education to the learner. Area-Moreira et al., (2020) shows us in his study of the University of La Laguna, a project called "Flexible environments of virtual and blended learning" which proved very adaptable to the abrupt change during the confinement by Covid 19, this experience allows him to conclude that virtual teaching is very effective and successful, but above all it is the means that can ensure the continuity of educational service in times of crisis. Virtuality allows us to discover and inquire into an intangible universe that houses a numerous amount of information that does not depend on a specific space (Dominguez et al., 2017).

On the other hand, Varguillas and Bravo (2020) recognize the barriers that virtuality represents for the educational community, some students deal with the lack of connectivity or access to technology, while teachers are affected by their deficiency regarding digital competencies compared to their students; in fact, in a research conducted by Llorens et al, (2021) found that the highest percentage of students in all the groups included in the study have digital competencies, which shows that they belong to generation Z, i.e. they are naturally linked to the virtual world and consider it part of their daily lives. Additionally, the study by Tejedor et al., (2020) confirms the perspective of both educational agents regarding virtual education; on the one hand, students visualize a weak technological training of their teachers, and these in turn affect the need to enhance awareness and decision capabilities regarding the use of digital tools in students; these skills are intended to instill in the educational community a proactive digital culture and the ability to achieve quality education.

3.2 PEDAGOGICAL STRATEGIES IN VIRTUAL EDUCATION

Virtual education brought innovation at the methodological and pedagogical level and even at the organizational level, increasing institutional communication links and the adaptation of all those involved to this new digital era (Martínez et al., 2018). As stated by Córdoba, et al., (2018) communication can occur both synchronously and/or asynchronously, the important thing is that it serves as a basis for monitoring the progress of the learner. However, achieving a satisfactory learning process depends significantly on the performance of the teacher and the use of pedagogical strategies that best suit the situation, mainly taking into account the learners and the technological progress that the world is going through. Sandoval (2020) points out as pedagogical strategies the "useful tools" or actions of the teacher that allow transforming the information to present it in a way that is accessible to the student's understanding. In other words, pedagogy is a crucial aspect for any educational modality, Martínez et al., (2018) grant the following definition: "[...] pedagogy should be understood as a process that transcends the generation of knowledge, forming integral subjects that recognize their environment and their own individuality." (p.3)

In order to originate an educational process, the teacher must establish a programming or work plan to generate learning, this implies deciding the approach and suitable resources to transmit the previously determined knowledge and fundamentally for the student to internalize it, where a determining part of the planning are the pedagogical strategies (Sandoval, 2020); thus, a student who uses the Internet on a daily

basis does not mean that he is part of the educational process (Fajardo and Cervantes, 2020). As shown by Quezada et al., (2021) in the results of their study, 39% of teachers believe that they were able to adapt their pedagogical system to virtuality, 25% required changing their teaching approach, 23% assumed virtuality as an effect of the knowledge era and 13% stated the importance of acquiring digital competencies to provide a better education; these findings demonstrate the demand of virtual educational dynamics.

Chinchay et al. (2020) consider that virtual environments are constituted from the various curricula added to the computer tools currently available. Technology drives students' initiative for the external search for knowledge throughout their learning process, but simultaneously allows them to rethink their previous knowledge internally with critical thinking and open to new learning; all this shapes the unique learning style of each student in this virtual environment, which is also influenced by their teachers, the pedagogical strategies of the educational program, the institution to which they belong and the quality of technology they can access.

Chong-Baque and Marcillo-García (2020) state that, in order for students to develop the necessary skills, attitudes and knowledge, the teacher must plan systematic actions to guide the learning process, which are called pedagogical strategies; these must be adapted to the different contexts and realities of the students, so as to awaken their interest through new experiences. Currently, the addition of technological tools to education demands a great change in the teaching style, since virtual pedagogical strategies must be student-centered and, above all, must be based on the level of technological mastery of the students. Thus Camarillo and Barboza (2020) comment on the success of the experience of law students at the Universidad Autónoma de Ciudad Juárez in virtual spaces, which lies in the students' effort to relate the information acquired and their previous knowledge, this through intrinsic cognitive processes that are linked to the sociocultural environment, allowing them to assimilate knowledge substantially. From which we can conclude that the teacher needs to nurture the motivation of the student to deepen the topics taught, making them reflect on the importance they mean in their daily, personal and academic life; in addition, as a mediator teacher's role to promote a profitable communication space, it is important to develop the cognitive and linguistic skills of the students for their proper interrelation during the management of the various interactive media, so that allows them to develop a criterion of selection and use of information to build their ideas.

For all that has already been developed, we can affirm that pedagogical strategies in the virtual scenario should result in an interesting and creative journey that teachers and students travel together, taking advantage of the students' familiarity with technology. We are facing a great demand for distance education, therefore its structure must be built on both levels, both in the internal educational community and in the extension of the scope of education.

3.3 TEACHER AND LEARNER COMPETENCIES FOR VIRTUAL EDUCATION

Among the competencies that teachers should develop when implementing virtuality in the teaching process, a key factor to take into account is the human dimension, since morals and ethics allow changing,

developing and integrally improving education. (2021), when studying the elements that guarantee the success of cyber coexistence, arrived at the following results: 17% prioritize respect as a key to harmony within the virtual educational community, 23% emphasize the importance of broad and direct communication, 31% express the need for empathy, 15% promote solidarity, 6% point out collaboration for common goals and 8% agree that information transparency should be revalued. In addition, the author warns that in order to combat the growth of the digital divide, codes of ethics must be restructured to take into account the current digitalization.

Aguilar (2020) insists on highlighting the self-management, analysis and the active and humanized educational process that can be achieved by promoting digital tools with proper management. Therefore, Domínguez et al. (2017) point out that it is vital that teachers are trained in the use and mastery of tools to use technologies, and can guide the access of learning to their students. In addition, Tabatabai (2020) emphasizes the importance of determining the digital requirements that teachers must have to manage their implementation in their professional development: online training and the use of communication tools such as videos, audios, chats and web, zoom, Skype, Google Hangouts Meet, among others.

Along the same line, Tejada and Pozos (2018) state that a teacher achieves digital competence when handling technological tools, he/she is able to develop the process of construction, production and evaluation in a creative way governed by his/her own rules. Digital competence is a process that goes through literacy and practice of it, reaching creative originality as a consequence of their professional development. To achieve the aforementioned skills we have to consider that there are some important situations pointed out by Cabero-Almenara and Palacios-Rodriguez (2020) which can influence in a relevant way on teachers when we talk about digital competence. First, understanding that, in order to achieve a competency, it takes time, that is to say, it is done step by step, and even more so when we talk about digital competencies. Second, the progress to achieve digital competencies is personal, therefore, teachers are at different levels of digital competencies and probably not all reach the highest level of digital development. Here is the challenge for education, especially for the teacher, who must extend his training in a conscious and collaborative way in the process of his life, to obtain more information, but with the ability to manage it in the most updated versions, according to our digital evolution.

It should be noted that, over time, the term digital competence has gone through different models, in the search to obtain the scope of its competence. Tejada and Pozos (2018) refer that, although there is no consensus profile on the formation of digital competence in teachers, it is essential to develop them in digital skills, in order to then adapt them to their pedagogical training in the teaching process. Teachers require comprehensive thinking when training themselves to transform into the digital world.

Reviewing the literature of Tejada and Pozos (2018), they mention in their study the reference of the model designed for digital integration in the development of teachers; considering their development over time, articulated them in three stages, the basic level focused by the approach and incorporation of digital skills in the performance of teachers, i.e. reaching a literacy: knowledge and understanding of ICT,

establishing educational capabilities; the level of deepening, allows progress through exploration and deep experimentation of ICT, adapts them in their teaching work with high levels of skill and sustainability, manages an extensive and valuable collection for its teaching strategy and evaluates its scope in different learning situations; and finally the level for the generation of knowledge, of superior scope for the teacher, being relevant the creation of knowledge aimed at innovation and creativity in the educational work and with projection to the social environment. Thus, we can affirm that the evolution of the stages is profound, the teacher learns and applies ICT and progressively incorporates them in his work through critical reflection, as a fundamental part of the procedure.

From the Latin American perspective, Martínez-Garcés and Garcés-Fuenmayor (2020) refer that digital competence is the teacher's mastery in the understanding, application and critical evaluation of digital and communicative tools, supported by didactic and pedagogical, ethical and moral standards. These authors relate discipline, pedagogy and technology in a digital competence, and consider literacy, inquiry, communication, preparation and production of arguments adapted to the digital era, safety in this era and daily problem solving, as the scopes that teachers should develop to achieve digital competence. Given the above list of scopes, how do teachers perceive and accept them? Regarding the acceptance and development of digital competencies in teachers, we question whether assimilation is late, teachers would have disadvantages at the beginning, but technology allows everyone to benefit from its versatility to adopt it and make use of its virtues while minimizing its drawbacks. Levano-Francia et al. (2019) point out that adopting digital competencies is to have the most useful and measurable results of the professional teacher training process in relation to the digital environment.

Padilla (2018) clarifies that the attitude of teachers towards technology depends a lot on their positive appreciation to include it in the learning process of the student in a dynamic way, but if it is negative they will refuse the transition; that is why teachers' attitudes are vital in the implementation of technology in the virtual classroom, but managing their beliefs radically with respect to technology will impact their results in a valuable way at the time of exercising their virtual teaching. Zambrano (2020) demonstrated in his research the relationship between digital skills and emotional intelligence of teachers, which points out that the more technological skills they have, the better management of emotions they have and vice versa, a scenario that causes a real impact on the teaching-learning process at this juncture. Zempoalteca et al., (2017) noted that the elements that teachers have in front of technology are related to age, access to technological resources, lack of support to understand the digital culture in education, security in a formal training in digital skills and the academic degree achieved by each teacher. Therefore, it is argued that initially an analysis is required in the process of digital knowledge and awareness in their attitude about their new role, as well as the scope provided by the management of technological tools in their virtual teaching, especially favoring the education of their students. In view of this comment, Camino and Maure (2020) point out that the provision of technological resources and a good educational use of them would promote the reduction of the differences between school and society.

4 CONCLUSION OR FINAL CONSIDERATIONS

From the results found, we can reach the following conclusions:

- Virtuality has revolutionized education in different aspects, both methodologically and pedagogically and even institutionally, because it has allowed to break down the limits of distance and temporality, being very effective to ensure educational continuity in times of crisis; however, it highlights the existing digital divide.
- Virtuality has almost completely restructured the role of the teacher, as he/she needs to develop more and more competencies, making virtual teaching a demanding challenge. In addition to pedagogical skills, digital skills must be added, and the approach to human skills such as the practice of ethics, empathy, respect, and communication skills must change, so that they are adapted to a virtual environment. The only use of digital resources does not contribute if they are not provided with the purpose of the teacher in their objectives, content and methodology to work with their students.
- For teachers to be able to connect effectively with their students through technology, it is crucial that they are trained in digital competencies; This does not mean that all teachers must reach a very high level of digital mastery, because each one must advance at their own pace, it depends on different factors such as their attitude towards technology, their management of emotional intelligence and their level of prior knowledge, the important thing is that they feel confident with the level they achieved; so Quiroga and Nappa (2020) state that the challenge for teachers is to develop the skills to learn, think and create in the new digital environments.
- In the virtual modality, teachers and students do not share the same physical space, it is essential that educators manage to encourage their students to develop cognitive and linguistic skills and the necessary criteria to search and choose the information they need, in order to allow them to have greater autonomy in their learning process. Students' learning is mediated by teachers, through interaction, the Educational Institution where they are, their socio-cultural environment and the technological tools at their disposal. Consequently, the appropriation of digital media becomes a constructive educational experience and requirement (Córdova et al., 2018).

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