Teacher digital' skills for online education in preschool and schools education careers

Sandra MONTENEGRO
Master program in Education with major in Information Communication Technology on Education, Faculty of Postgraduate Studies.
Department of Pedagogy, Faculty of Philosophy, Literature and Educational Science, Universidad Técnica de Manabí
Portoviejo, 130113, Ecuador

Karina MENDOZA
Department of Pedagogy. Faculty of Philosophy, Literature and Educational Science, Universidad Técnica de Manabí
Portoviejo, 130113, Ecuador

Carlos CHANCAY
Department of Foreign Language Pedagogy. Faculty of Philosophy, Literature and Educational Science, Universidad Técnica de Manabí
Portoviejo, 130113, Ecuador

Katty POSLIGUA
Department of Pedagogy. Faculty of Philosophy, Literature and Educational Science, Universidad Técnica de Manabí
Portoviejo, 130113, Ecuador

Jaime MEZA
Computacional Systems, Universidad Técnica de Manabí
Portoviejo, 130113, Ecuador

ABSTRACT

In order to cover the educational needs generated by the accelerated change in the rhythm of life of society, the creation of other study modalities arises that allow access from anywhere, in this sense, the online education modality emerge, it requiring teachers to evolve in their skills to be participants in this teaching-learning process. This research propose a pedagogical strategy based on the use of tools that allow the development of teachers' digital skills in the face of virtual learning environments in the online modality of the in preschool and schools education careers of the Technical University of Manabí. A descriptive level methodology is addressed, supported by a mixed approach. Early outcomes shown the importance of digital competences to face the educational need of today's society, and, the training needs of the teachers this environments. The training strategy based on the use of tools for the development of digital skills promotes significant learning in teachers, and allows them to satisfactorily face virtual learning environments, due to the high motivation that their use generates efficient in these environments.

Keywords: Digital skills, virtual environments, teachers, training strategy, online modality.

1. INTRODUCTION

In order to cover the educational needs generated by the accelerated change in the rhythm of life of society, the creation of other study modalities arises that allow access from anywhere. This need allowed the creation of virtual education and closely related distance education; In the same way, the online modality was born, among others, requiring teachers to evolve in their digital skills to be participants in this teaching-learning process.

According to Quintana [17], a teacher's digital competence is "the ability to master knowledge, skills, and attitudes to optimally use ICTs in both the teaching and learning process of the student." In this regard [16] states that the digital skills developed by the teacher allowed him to respond effectively and efficiently to the changes that occur, in a continuous and accelerated way, the technological advances of globalization. [6] in his study: "digital skills in upper secondary education teachers", (Master's Thesis) at the Instituto Tecnológico de Monterrey, Naucalpan, Mexico. With this investigation it was determined that the competences need to be consolidated by the teacher around the use of educational technologies axis.

In the Ecuadorian context, the Secretaría de Educación Superior, Ciencia, Tecnología e Innovación (Senescyt) has been expanding the coverage of the online academic offer at the national level, achieving that thousands of students from different places have access to higher education, strengthening in a pertinent and responsible manner to the teaching staff to successfully achieve its implementation and permanence.

It must be considered that virtual education is related to distance education, which was born as a result of the need for quality educational coverage for people who, due to distance and time, cannot travel to a training center. This need allowed the creation of online modalities, forcing teachers to be participants in this teaching-learning process.

The experience of the author of this work as a follow-up tutor in the initial and basic online careers of the Technical University of Manabí has made it possible to demonstrate the shortcomings of digital teaching skills compared to virtual learning environments. It was observed that teachers do not use technological tools adequately due to lack of knowledge, lack of skills to execute innovative strategies aimed at developing the pedagogical

process through digital resources, do not have knowledge regarding digital skills, are unaware of the use of virtual environments and lack of institutional support for training; among the most prevalent.

This problem leads to the following formulation of the problem: how to contribute to the development of teachers' digital skills in the face of virtual learning environments in the online modality? It is proposed as an objective to design a training strategy for the development of digital skills of teachers in the virtual learning environments in the online modality of the Initial and Basic careers of the Technical University of Manabí.

In order to fulfill the general objective, the following specific objectives are established: 1) To base the theoretical references that support the importance of digital teaching competences and virtual learning environments in online mode of the Initial and Basic Careers of the Technical University of Manabí ; 2) Diagnose the current state of digital teaching skills and the management of virtual learning environment tools in the online initial and basic careers of the Technical University of Manabí; 3) Prepare the structure and activities of the training strategy for the development of teachers' digital skills through the use of tools in virtual learning environments in online mode; and, 4) Validate the feasibility of applying the training strategy designed for the development of digital teaching skills.

2. DEVELOPMENT

The systematization of the case study carried out in the Initial Education and Basic Education careers, online modalities, of the Faculty of Philosophy, Letters and Educational Sciences, of the Technical University of Manabí is presented, starting with a theoretical methodological support.

Phase 1: theoretical systematization (Literature Review).

Virtual learning environments: The virtual environment is the set of means of different synchronous or asynchronous interaction that is carried out by means of software that complements interaction and collaboration in the classroom. The importance of the use of technological tools for learning has become much more remarkable, since the traditional model has been modified, therefore, education professionals have seen the need to acquire new pedagogical skills, which allow them to propose new methodologies and face new educational challenges [9].
Digital Competences in teachers: [13] affirms that the te
acher's competencies in the educational framework are established based on the needs or demands of the time, therefore, it is essential that the educator accommodate and develop capacities that seek to satisfy the new training needs of future professionals, which are mediated by the context of the time. "In the current context we find ourselves immersed in a society that is increasingly oriented towards the process of massive technification." (p. 537, 2018). The need to use them or their obligatory recurrence can be sustained in what was stated by [7] when mentioning that the "...technological revolution has reached the classrooms, either by the hand of the students, by the teachers themselves or as a claim of society, and therefore we cannot ignore it" (p.1, 2018). An important point for the university professor in correspondence with modern technologies is adapting to them, which in itself is not an easy task since, among other things, it will require them to adjust to digital literacy and everything that it demands. [7]; [14]. On the other

hand, [16] indicated that some studies have suggested that, if teachers use sufficiently concrete knowledge, they will be able to highlight the drawbacks that arise and thus integrate technology into their experience.

Virtual learning environments in the development of digital skills: Specifically, in higher education, the constant training of teachers should promote the autonomous learning of the student body, stimulate research and problem solving, through practical exercises and the use of tools. technological. In this way, competent students and professionals capable of effectively responding to the current demands of the country will be created [19]. On the other hand[5] it confirms that, despite the implementation of technological tools in education and the commitment of teachers to continue updating and imparting their knowledge with a good predisposition and positive attitude, the lack of interaction and social exchange that the student used to feel in face-to-face environments, on the other hand [20] indicates that the aspects of innovative teaching practice, emphasizing the importance of the teacher mastering his field of action, but also being a reflective entity that manages to achieve the different elements that allow you to transform; This is precisely what virtual environments allow in the learning process, learning and incorporating new contexts so that students develop digital skills, to the extent that their teachers lead them towards the benefits of technology.

Phase 2: materials and methods

The methodological approach comprises a type of descriptive research. A mixed approach design, parallel design, supported by a multiple case study was applied based on [10], [18]. This work was carried out at the Technical University of Manabí, Faculty of Philosophy, Sciences and Letters of Education in the Initial and Basic Careers of the online modality, where 99 teachers were research subjects, including authors and follow-up tutors and 2550 Initial Education students and 2750 Basic Education students. A random probabilistic sampling was applied, in which a sampling formula was applied to the total population of 5300, with a margin of error of 10%, yielding a total of 94 students at a reliability level of 95%.

The calculation used to draw the sample is proposed:

p = q = 50%
N = population size = 5300
e = margin of error = 10%
z = confidence level = 95%
σ = confidence level constant 1.96

$$m = \frac{(N)}{1 + \frac{(e)^2(N-1)}{\sigma^2(p)(q)}} \qquad m = 94$$

Regarding tutor teachers, authors and follow-up tutors, no sampling was carried out since 100% of the population was taken.

The techniques used to obtain information were the following:

Techniques	Tools	Objective	Application
Survey	List of questions	Diagnose teachers' digital skills	Teachers
Observation	Observation form	Conducted a classroom observation (RESEARCHER)	Authors, Tutors, Students in the process (monitoring tutors)
Survey	List of questions (Survey form)	Assess if the teacher possesses digital skills from the students' perspective	Students
Interview	Questionnaire	Conducted an interview to verify the teacher's digital skills	Monitoring tutors
Focus group	Interview guide	Conducted a group interview with a specific focus group, addressing questions related to the protocol's objectives	Authors and tutors (teachers)

Phase 3: results

In the country, the valuation of technology for the development, appropriation and dissemination of knowledge determined that the National Plan for Science, Technology, Innovation and Ancestral Knowledge (2013-2017) in its policy 6 establishes "...incorporate new information technologies information and communication to the generation and dissemination of knowledge so that they contribute to boosting national production with the following improvement in the quality of life of the population". Said objective is attached to the technological advances that the degree must incorporate. The foregoing would involve that the professionals who are trained in the Basic and Initial Education career strengthen their capacities in the management of technological tools applied to the methodology of work in the classroom, aware that this represents promoting autonomous and collaborative learning, to facilitate investigative processes.

For the creation of the Basic and Initial Education careers in online modality, it was generated with the sum of the efforts of five public universities: Technical University of Manabí, Central University of Ecuador, State University of Milagro, Technical University of the North and Universidad of the Armed Forces-ESPE. An innovative proposal was presented that allowed access to quality teacher training, with the use of virtual media and overcoming mobility and geographic location barriers. Tutors and teachers had to use technology, materials and be a guide-mediator or facilitator of learning to contribute to the development of conceptual reasoning, strengthening continuity of thought and motivation of student interest. The five universities have technological support for comprehensive training. The virtual system of the Technical University of Manabí made it possible to manage, distribute and control the activities of the non-contact training learning management process, of the Learning Management System type, with a definition of a content management system of the Content Management System type that empowered the exchange of learning social tools, blogs, wikis, multimedia content, video chats, forums, 3D environments, video games, etc. All this allowed interaction with people and providing information

between users of the computer platform, the services contained in the electronic portals through policies regarding the operating time of the classrooms or the virtual campus, which determine availability 24 hours a day and access from all types of electronic devices, through the use of more advanced technological and communication elements within the process objects simulating situations real. This entire process was based on policies that allow users to provide relevant information on the technological and connectivity requirements necessary to study the degree in the online modality.

The questionnaire was used with the purpose of making a diagnosis and evaluating the level of preparation of teachers in digital skills. For this research, the questionnaire was extracted from the article entitled "questionnaire to assess teacher digital competence and the use of social networks by teachers in their initial training" from [8]. Said instrument was considered adequate to the needs of the researcher and some questions were adapted for its application. After this, the changes made were sent to experts to be validated and then a pilot test was applied to determine the reliability index by means of Cronbach's Alpha.

For the analysis of the results, the TPACK method was used, which includes the three types of knowledge in digital skills: knowledge, pedagogy and technology.

Once the information from the participants was obtained through the survey, the data analysis was carried out. During this process, the following could be identified in a general way: in terms of age, it was observed that the majority of the participants were in the 41-year-old or older group, followed by the 31-40-year-old group. There was a minority of participants aged between 20 and 30 years. In relation to gender, it was found that the majority of the participants were women. In addition, the opinions and perspectives of teachers regarding Information and Communication Technologies (ICT) were taken into consideration. The following significant advantages were highlighted: access to information, the diversity of methodologies and the possibility of publishing information. However, limitations were also identified in the use of ICT, such as technical failures, access to the network, teacher training and the prior knowledge that users should have.

DIMENSION A: CONTENT

In the initial diagnosis, it is evident that teachers consider they have moderate knowledge about the use of ICT tools. During the focus group with the tutor teachers and authors, when inquiring about their knowledge of the content to be taught. It was observed that they are almost always integrated into the tools used, addressing the contents with clear and structured conceptions, maintaining continuity in them. The students, when asked in the survey about the dimension of knowledge, corroborated that teachers always address content in accordance with the knowledge that is intended to be taught. For their part, the follow-up tutors expressed that the teachers almost always master the contents of the subjects. This information was also supported by the documentary analysis of the records of teaching activities carried out by them. Additionally, the researcher, as part of the group of follow-up tutors, carried out direct observation of the teaching-learning process in the online modality. During this observation, he collected first-hand information, evidencing that, in terms of knowledge, teachers tend to develop and organize the virtual learning platform effectively in most cases.

DIMENSION B: PEDAGOGY

In the initial diagnosis, it was evidenced that teachers consider accessibility for students with disabilities and constant support for learning to be important. The relevance of the use of resources by students was highlighted, as well as the ease of use of digital skills for teachers, regardless of socioeconomic situation, in order to facilitate access to digital resources and strengthen didactic innovation. in the teaching-learning process. It sought to enhance knowledge in the classroom, motivating and encouraging the dedication of teachers, sharing concerns and using open content in virtual learning classrooms. In the focus group, when inquiring about the knowledge of general pedagogical activities and the processes and practices of the teaching method, the tutor teachers and authors indicated that they almost always integrate effective pedagogical techniques. However, only sometimes do they combine them with technological resources, almost always responding to the needs of the students. On the other hand, students have different opinions when asked about the pedagogical dimension, adding that teachers adequately manage the knowledge of the teaching and learning processes. The follow-up tutors expressed that almost always the teachers demonstrate pedagogical and significant competences in the management of their class and the contents they teach. This information was supported by the documentary analysis of the records of teaching activities carried out by them. In addition, the researcher, as part of the group of follow-up tutors, was able to directly observe the teaching-learning process in the online modality. During this process, first-hand information was collected, evidencing that, in terms of the pedagogical dimension, teachers always adequately manage the learning resources on the virtual platforms, they almost always adequately manage the qualification processes on the virtual platform of learning and sometimes proactively use the forums, chats and emails integrated into said platform.

DIMENSION C: TECHNOLOGY

In the initial diagnosis, it was evidenced that the teachers considered that the majority of them had a moderate knowledge of the basic concepts associated with ICT. They indicated that they had fair to moderate knowledge of the basic hardware and software components in the computer. They also noted that the optimal selection of resources was moderate and the ability to resolve incidents was regular. In addition, it was noted that autonomous learning by teachers was considerable due to the lack of institutional support. In the focus group, when inquiring about the operation of technologies and the modes of presentation to develop activities, the teacher authors and tutors indicated that they almost always knew, handled, integrated and applied technological tools in virtual environments to teach the subject. However, the students differed when asked about the technological dimension in the survey, highlighting those teachers always knew, managed, integrated and applied technological tools in virtual environments to teach the subject. The follow-up tutors expressed that sometimes they adequately used and integrated technological resources in their pedagogical practice, and almost always demonstrated knowledge and management of the same in the total teaching of the subject. This information was supported by the documentary analysis of the records of teaching activities carried out by them. In addition, the researcher, as part of the group of follow-up tutors, carried out direct observation of the teaching-learning process in the online modality. During this observation, he collected first-hand information, evidencing that, in terms of the technological dimension, the teacher almost always adequately taught the synchronous class using virtual environments and digital resources.

In the diagnosis, it was observed that teachers have a moderate level of knowledge and frequently use some tools within the technological dimension, especially the habitual application of visual presentations and the frequent use of forums in their virtual learning classrooms. Likewise, there is evidence of a regular practice of collaborative networking and the moderate use of videoconferences to interact with students.

Phase 4. Proposal: Training strategy in digital skills to strengthen teacher performance in digital environments

This section deals with the design of a proposal based on the diagnostic study carried out in the online Initial and Basic careers of the Technical University of Manabí, and with the theoretical support of the consulted referents.

The theoretical foundation is based on the exhaustive analysis of the theoretical references consulted regarding the development of digital skills to strengthen teaching performance in digital environments. In this, it was obtained as main premises that digital competences are the skills and abilities to manage information technologies for a better execution of virtual learning environments. The teaching performance allows the use of different teaching-learning methodologies that strengthen the capacities and competences of each one of the students, the digital environments allow to complement the synchronous training given by the teacher since it integrates different tools, materials and resources, managing to interact through the media. virtual. The methodological foundation is based on the diagnostic study carried out through various methods, techniques and instruments applied to tutor teachers, authors, students and monitoring tutors of the Initial and Basic online careers of the Technical University of Manabí in which evidence that some teachers have a basic knowledge of digital skills in the virtual environments used in this modality, which due to ignorance or lack of motivation do not apply in their virtual classrooms, turning students into incompetent subjects in the modern world, since they do not develop their skills to improve teaching-learning processes, likewise the proposal will be flexible, adaptable since it allows interdisciplinary training by maintaining direct contact with the contents and applying knowledge directly in their classrooms.

Regarding the requirements for an efficient development of the training strategies, technological equipment (computer, tablet), connectivity, endorsement of the authority is demanded, it should be noted that our objective is to strengthen teaching performance in the face of virtual environments through a strategy training in digital skills in the online initial and basic careers of the Technical University of Manabí, for the fulfillment of this objective the following specific objectives were established: 1) Plan the methodical and sequential procedure of the training strategy; 2) Run training workshops in synchronous and asynchronous virtual environments; 3) Evaluate the strategy designed in its different moments.

This proposal is conceived in a design of three stages that are planning, executing, evaluating, each one with its different actions and recommendations. This is how its structure looks like:

Figure 1

STAGE 1 planning: the objective of this stage is to plan the process of immersion, design and socialization of the training strategy, within this the immersion, design and socialization stages were described, in this way it is detailed that in the immersion stage a call to all teachers of the online Initial Education and Basic Education careers requesting as the main requirement the predisposition to participate, learn and improve the knowledge of digital skills in the face of virtual learning environments, on the other hand, the design stage consisted of throughout the process carried out to achieve the training strategy that was designed as an alternative to improve digital skills, supported by user guides so that they can be applied in the different activities related to teaching-learning on virtual platforms, therefore the socialization stage was planned for two moments, to the scientific community through this article; and, to the academic community in a coordinated session with the respective authorities of online careers.

STAGE 2 execution, aims to: Execute training workshops in synchronous and asynchronous virtual environments applying a designed manual, allowing to describe the stages of the different workshops to be taught. That is why three training workshops were coordinated with the respective authorities of online careers where the following topics were focused:

Synchronous virtual environments: These environments allow a real-time interaction between teacher-student, managing to resolve different doubts at the precise moment, as well as being able to interact live with classmates in the different activities that are presented, it should be noted that for these meetings in the online careers of the Technical University of Manabí the Zoom platform is used, for this a workshop was created in which it will be possible to access to know in depth the operation of the Zoom platform, which is used for synchronous meetings in the online classes, it should be noted that the zoom platform is a tool that allows you to work online, make video calls, with a desktop sharing functionality, whiteboard, chat, record the conference, share documents and be able to access from anywhere and any device.

Asynchronous virtual environments: These environments achieve the independence of the student, encouraging them to organize their time since it allows access at any time to review the material, as for the tool used in these meetings is the Moodle platform, in fact it was developed a workshop which shows how to effectively manage the platform so that teachers can plan their

activities in asynchronous meetings in online classes, therefore, Moodle is an online learning and interaction platform between teachers and students, it presents an interface as simple and intuitive in which the course can be published in a dynamic and interactive way with the possibility of being able to access it from anywhere

Digital tools: digital educational tools are tools for content management, for interaction with students and gamification of learning, allowing the construction of knowledge and achieving digital skills in students, therefore the workshop has included tools that will allow favorable transformations to be obtained that motivate students through the interaction and manipulation of the different tools, facilitating student learning in online classes.

STAGE 3 evaluation, aims to: Verify the feasibility or results obtained from the various evaluations, so that the stages of initial, procedural and summative evaluations can be described. The initial evaluation begins in the immersion phase, which began with a call to deepen and improve the previous knowledge of teachers regarding virtual learning environments, evidencing in a certain way that knowledge is basic and requires a deep immersion in field. The formative evaluation promotes learning since it not only focuses on measuring results but also adds feedback as a characteristic element of this evaluation. In this case, this evaluation was developed during the training process of the workshop, using the main characteristic (feedback) of this evaluation system that allows attention and progressive improvement of learning. The summative evaluation gives us the opportunity to assess the learning obtained in the development of a process and determine if the objectives set were achieved. The degree of satisfaction test will be applied to the teachers involved, which will provide us with the effectiveness of the workshops carried out.

3. CONCLUSIONS

The theoretical references analyzed support the importance of digital skills to meet the educational need of today's society. With a diagnostic study, it was possible to demonstrate the training needs of the teachers of the Initial and Basic online careers with respect to digital skills. The inputs obtained allowed the efficient development of a training strategy aimed at improving digital skills.

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