



Curricular proposal and training plan for the implementation of the virtual distance modality in the Preparatory School of the UNAN-Managua: Integration of the ADDIE instructional model with a constructivist pedagogical approach

Yaosca Javiera Urroz Páramo

National Autonomous University of Nicaragua, UNAN-Managua

Faculty of Education and Languages. Department of Educational Technology

Bachelor's degree in educational sciences with a major in Educational Informatics

Master's Degree in Virtual Teaching and Learning Environments

<https://orcid.org/0000-0001-6004-5487>

yurroz@unan.edu.ni

Submitted on September 12nd , 2023 / Accepted on May 23rd, 2024

<https://doi.org/10.5377/rtu.v13i37.17985>

Keywords: Instructional Design, Virtual Learning Environment, Virtual Distance Modality, Curricular Proposal, Virtual Tutoring.

ABSTRACT

The work presents a curricular proposal for the implementation of the virtual distance modality in the Preparatory School of the Faculty of Education and Languages of the National Autonomous University of Nicaragua, the research design is non-experimental, descriptive, and with a mixed approach. A diagnosis was made through the SWOT analysis to know the current situation of the Preparatory School in terms of the human competencies and capacities of the teachers before the implementation of the virtual distance modality, strategies were defined for a better organization and work methodology in the virtual modality. A curricular proposal with a constructivist pedagogical approach is proposed,

which includes the instructional design of the courses for the development methodology in the virtual learning environment Moodle. In addition, a teacher training program was developed to reinforce teachers' knowledge and prepare them for their performance in the virtual distance learning modality. It was concluded that it is necessary to implement a propaedeutic course for students who opt for the virtual distance study modality, as well as the integration of a specialist in the area of Online Education who provides pedagogical accompaniment to teachers who are in the process of virtualization of the subjects and during the virtual teaching and learning process.

INTRODUCTION

One of the potentialities that the virtual distance education modality brings with it in the Preparatory School is the reach and coverage at the national level of the students, in addition to the possibility that students can learn at their own pace and stimulate self-learning them.

One of the difficulties that the Preparatory School has is that the students have a high degree of absences, in most cases, it is due to the work hours they have, which contributes to school dropout.

To achieve a fuller inclusion of the population that has not had the opportunity to carry out secondary studies, it is necessary to create new options for access to education, which is why there is a need for a different modality such as the virtual distance modality, so that they can choose to carry out their secondary studies.

In the Preparatory School at UNAN-Managua, teaching-learning process takes place under face-to-face modality, creating a new alternative modality to this, will bring with it advantages and benefits for the Nicaraguan population, combating the barrier of space, time, and distance.

To improve the educational program for young people and adults in the training of high school students, UNAN-Managua, through the Preparatory School, faces the need to improve its technological and organizational development environment by offering a quality education, accessible to the Nicaraguan population, promoting the use of information and communication technologies as an excellent means to improve learning in the digital age in an innovative way.

Given the situation raised, it should be added that teachers who teach subjects in the Preparatory School do not have training in virtual tutoring. For this reason, a training program for teachers is proposed for the implementation of the virtual distance modality, in turn, a curricular proposal with the instructional design for the implementation of the virtual distance modality in the Preparatory School based on a diagnosis to know the needs in terms of the human resources of the institution.

This proposal will make it possible to raise the educational coverage index for young people and adults who did not finish high school in the regular system and will be able to opt for an alternative program in the Virtual Distance High School.

In addition to the above, teachers will be able to expand the scope of their knowledge effectively and efficiently in the virtual teaching and learning process.

In addition, finishing high school at a virtual distance has the same official validity as studying in person, since the student will obtain the certificate with which they will be able to continue to the next level of education upon graduation.

METHOD

This research has a mixed philosophical approach, as both quantitative and qualitative research instruments are applied. Surveys, interviews, and a focus group were conducted. A validation process of data collection instruments was carried out with the support of two experts in the research area to ensure that the data were consistent, contributing to the accuracy and precision of the results.

The quantitative approach was used for data collection and analysis to answer research questions with the use of statistics to accurately establish patterns of behavior in a population.

The qualitative approach was also used to describe the research questions based on data collection methods without numerical measurement, such as interviews and focus groups, to reconstruct reality, as observed by those involved.

The research is non-experimental and descriptive. It is non-experimental because it is carried out without deliberately manipulating the variables, the process in this type of research is to observe phenomena as they occur in their natural context, and then analyze them. No situation is constructed, but already existing situations are observed, not intentionally provoked. It is descriptive since a description of each of the variables and indicators involved in the study is made, during the process, no variables and indicators have been intervened, nor altered, and the data to be collected are obtained from the Preparatory School of the UNAN, Managua.

This research is cross-sectional, because it collects data in a unique time, from March to May 2021, taking advantage of the availability of teaching staff and students to achieve an approach to different opinions about a possible online learning experience for secondary education, where technology is the main ally. Providing access to education by breaking down geographical barriers and promoting autonomous learning, in addition to knowing the technological competencies of the population in question, data collection is carried out to describe variables and analyze their incidence and interrelationship at the given time.

Population

The high school has a total of 1000 students distributed as follows:

Academic year	Groups	Students
Level I	7	280
Level II	12	480
Level III	6	240
Total	25	1000

The preparatory school has a principal teacher and a total of 38 teachers in the different subjects for the first semester of 2020.

Sample

The population subject to the research was made up of students from the Preparatory School of the Sunday shift, in the following table shows the details of the students by level corresponding to the I semester 2020.

Level I	Level II	Level III	
280	480	240	
6.80%	6.80%	6.80%	
19.04	32.64	16.32	
19	33	16	68

To obtain the sample, the convenience probability sampling formula was used:

Sample size

$$n = \frac{Z^2 * N * p * q}{e^2 * (N - 1) + (Z^2 * p * q)}$$

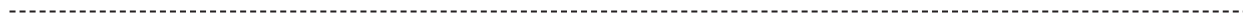
Where:

Z = confidence level (corresponding to table of Z)

p = Percentage of the population that has the desired attribute

q = Percentage of the population that does not have the desired attribute

N = Size of the universe



e = Accepted Estimation Error

n = Sample size

The head teacher and 7 teachers from different areas who teach classes at different levels were taken into account.

RESULTS

Technological Competencies in Students

Among the students who are currently studying in high school, most of them have mastery of ICTs, in general, many people make use of technology, taking advantage of their interests and there are certainly people whom a virtual distance modality can encourage them to continue their academic training. Next, the sections of the chart are defined:

Excellent, the values represented reflect a positive result and may be above expectations.

Well, in addition to presenting a positive performance, like the previous one, it can also be said that the results demonstrate a satisfactory level.

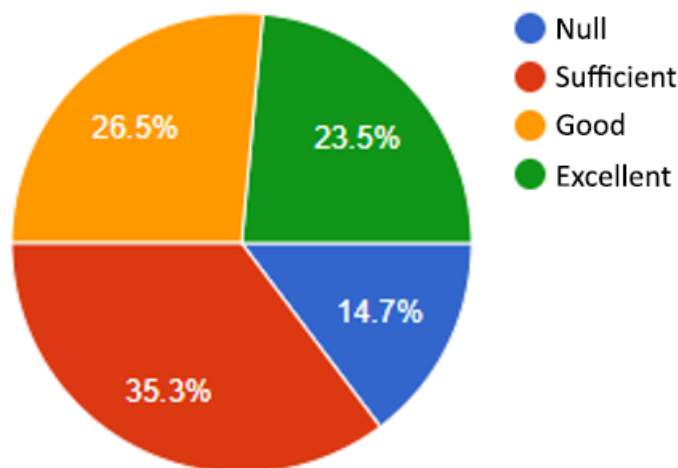
Enough, in this section, the values represent an acceptable result, although they do not show an outstanding performance there may be room for improvement.

Null, the values represented in this section are negligible, indicating a result below expectations.

Proficiency in the use of ICT

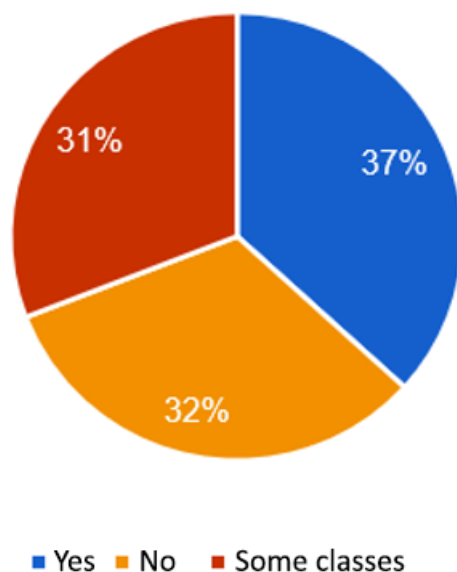
Figure 1.

Mastery of skills in the use of ICT.



The majority of students show interest in studying high school in the virtual distance modality, the following graph shows the results of the opinions obtained by students, where 68% of the students surveyed say that they like the idea of studying online or that they would choose to take some classes online.

Figure 2.
About Studying Online

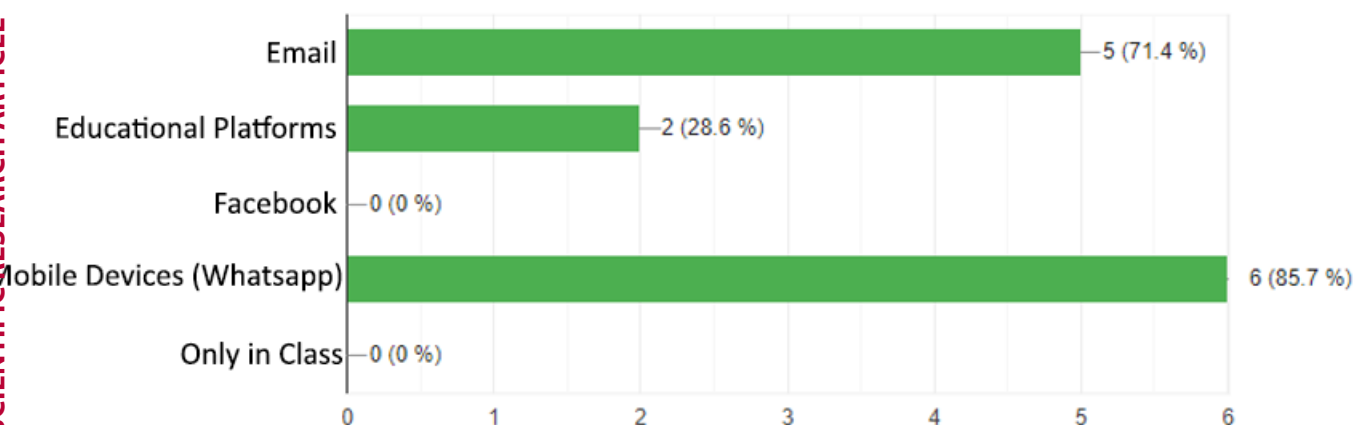


Technological Competencies in High School Teachers

In the virtual distance modality, communication is a key element. The teachers mentioned that currently, in the face-to-face modality, they use different means to communicate and interact with them.

Means of communication with students

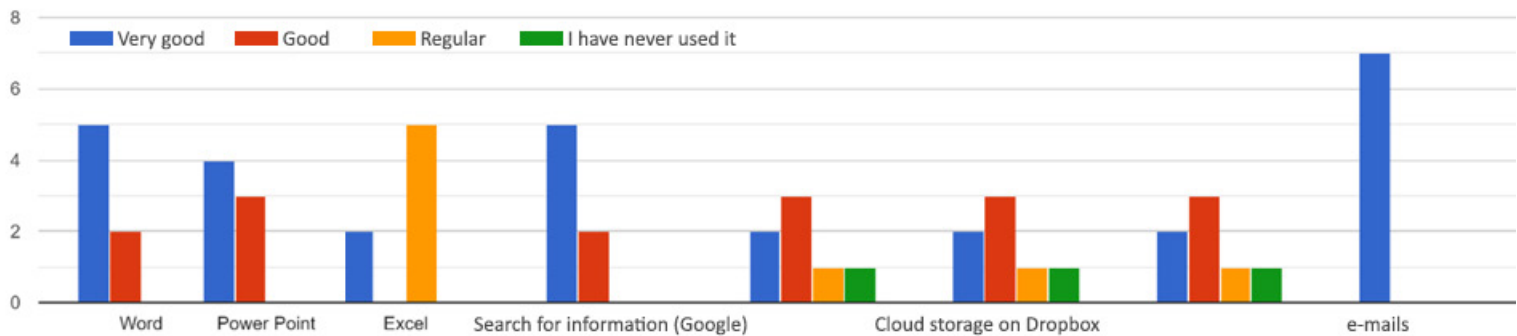
Figure 3.
Teaching media



They also mentioned that they make use of educational applications such as PowerPoint, Excel Word commonly, and Word, which is where students are guided to the activity and then they send their work through the same documents. In addition, some teachers make use of CANVA and other platforms and clarify that most of them are online, another very important fact is that they have also used SPSS and Excel statistical software.

Figure 4.

Proficiency in computer programs



In the focus group conducted with teachers, they were asked if they feel qualified to teach virtual distance classes for the High School and, if they have the availability to teach online, some of the answers were as follows:

- “As teachers we are self-taught and we have to get involved in new ways of educating, we have to go hand in hand with technology, we look for what we don’t understand, we are teachers.”
- “I say yes, I’m available and if there’s something I don’t understand or can’t do, then that’s why we’re teachers and we’re known for being self-taught.”
- “We must prepare to do the virtualization of each course if virtual distance education is implemented in the High School. But it would be good if at the time of doing a virtual course bring an accompaniment so that they can review, suggest, and help us because we are not experts in online education, but we are experts in our area.”

Regarding some virtual platforms for the Teaching and Learning process, the teachers mentioned that they have used MOODLE, EDMODO, and CLASSROOM, however, they consider that they need a guide for better assimilation in the use of these platforms.

Human Resources in High School

The teachers at Preparatory School have received training courses through the DEDV in different topics, such as the use of the virtual platform, digital educational tools, online tutoring, and communication through virtual platforms among others, given this, the teachers say they

feel prepared in case the virtual distance modality arises. On the other hand, teachers expressed that during the pandemic they implemented online classes informally, some used Classroom and WhatsApp to communicate and keep up to date with teaching activities and homework assignments to students, they commented that it was a satisfactory experience and that the students they learned new didactic strategies without being in a face-to-face class.

DISCUSSION

Technological and human competencies presented by teachers and students for the use and management of virtual platforms.

In the interview with the principal of the Preparatory School, he mentions that several teachers are creative and that some use websites where they hold a forum where questions or consultation can be made between teacher and student. The principal adds that many of the teachers who are in the high school are very willing to teach online and that they have also made use of technology, so that students work online, either by cell phone, through WhatsApp, or by mail to send and receive homework. It highlights that some teachers have received training in the use of virtual platforms offered by the DEDV of Nicaragua and training in the use of ICTs by the Ministry of Education.

In the same way, in the focus group carried out with teachers, it was found that they are willing to teach online, adding that if there is something they do not understand or cannot do, as teachers they are characterized by being self-taught. They emphasize that as high school teachers they have received courses or training on ICT integration, they allude to the use of tools that help them work online with students, due to the events in which the country has been immersed with the pandemic, they have managed to guide learning activities to students with the support of technology, They point out the integration of ICT in the teaching process by making use of educational applications, for the creation of concept maps, CANVA tool, GeoGebra to graph functions and even the use of the statistical analysis program SPSS. They make it known that they make use of email, computer programs such as Word, PowerPoint, and Excel, have electronic devices at work or home, as well as internet access. In addition to all this, there is communication with students via WhatsApp, chat, and email. Some students have had the experience of working with Moodle for some careers at UNAN, Managua, and UALN.

According to the survey applied to students, it was found that most students have used virtual platforms which they mention Classroom, Moodle, Edmodo, and the Zoom platform in some cases, they refer to the integration of ICT as part of their learning when asked if they make use of some computer programs to enrich their learning, To which 8.8% corresponding to 6 students in the sample responded that they do not make use of technology. It was also found that everyone owns electronic devices, and more than half responded that they have access

to the internet, only 2% of the surveyed population said that they rarely have access to the internet. They were asked about their opinion on virtual distance learning and the vast majority refer to it as equal to or superior to face-to-face training. Another relevant fact is that all the students are from Managua and its surroundings, without a doubt the implementation of the virtual distance modality for the Preparatory School would be a great benefit for the Nicaraguan population, in this study 46 of 68 students surveyed said that they would like to study online or that at least some classes were taught in that modality, In addition, it was found that a large part of the students have a job and in some cases have access to the internet and electronic media in their workplaces.

Teachers first and foremost express that the largest population of high school students has a phone and some own computers, and they are also adults and face a wall with students who have not studied for two or three years, in addition, currently, not everyone has access to the internet to work online. They also state that sometimes the way of learning with technology is being misused by students, students must know what the purpose of technology is in education.

With this information, it was found that teachers are willing to teach online and affirm that if it is necessary to learn they will do so, they make use of technology in some formal and informal ways at the same time, they are open to preparing as tutor teachers for this virtual distance modality, they also show enthusiasm to learn. The authors Hammond and Sykes (2003) argue that some characteristics that are important for good teaching are enthusiasm, flexibility, perseverance, and concern for students, these are some characteristics of high school teachers, as well as the principal when he says that teachers are open to the possibility of teaching through the virtual distance modality.

Teachers are constantly updated with the Ministry of Education regarding the use of ICT and some previously with Pro-future, it is a very important fact, as indicated by McBer (2000) who found in his studies, a series of characteristics in teachers that significantly influence the student's progress. These characteristics refer to a series of dimensions and capabilities associated with professionalism, thinking, planning, leadership, and relationships. Similarly, Heras and Espinoza (2015) point it out as follows: "Currently, Information and Communication Technologies in the educational context are subject to review due to the importance of a teacher having the necessary skills to face this technological change, that is, being trained to use them. management and subsequent didactic implementation".

Regarding students, García Aretio (2014) mentions that what we know about students who study in distance learning modalities is that: they are usually people who work and who also allocate time to study, in addition to being self-taught, which agrees with the results of the survey, since in the Preparatory School many of the students keep a job with a time difference and

take the time to study and attend the center This is not the case for everyone, as some students do not have a job, but they have the motivation to study. However, for many Preparatory School students, studying online is an option.

Curricular Proposal for the Virtual Distance Learning Modality of the Preparatory School

For the implementation of the virtual distance modality within the curricular design, the student is conceived as the main actor who will mark trends, conceptions, and innovations in the knowledge society, about the different learning alternatives where elements such as the mediator, learning objects, self-learning activity, virtual communities of practice and ICT advisors converge for the achievement of the proposed objectives.

This proposal is based on the constructivist model, focused on the construction of knowledge. Where the student is the main protagonist of their learning.

The curricular proposal comprises two sequential stages: macro planning and micro planning.

Macro planning will consist of the following elements: construction of the justification, foundation, and objectives of the academic program; Professional academic profile, curriculum, general teaching-learning methodology, evaluation system, and entry requirements.

Micro-planning will consist of the development of subject syllabi and didactic planning. Then, the instructional design that will depend on these stages is proposed.

In the interview with experts, it was found that a work team should be organized that integrates a designer for the multimedia elements, and an expert in the content, on the other hand, the director of the Preparatory School mentions that the Directorate of Virtual Distance Education has everything necessary for this process. Therefore, it is considered that the high school has the support of its advisor for a better organization of work with the Directorate of Virtual Distance Education.

It was also found that the situation must be assessed to choose the most appropriate instructional design for virtualization, but the one that is commonly used is the ADDIE model, they point out that to be successful in the development of an online course the initial and final intentionality must be very clear, in the same way the didactic planning must be specified taking into account the online education tools.

Regarding the virtualization of courses, he affirms that the best way to organize a virtual distance course is per week, he also adds that the ideal pedagogical model for this modality is the constructivist one, but in many cases, it is necessary to make a combination of pedagogical models.

In this interview, the expert found that among the technological competencies of a teacher are the mastery of office tools, being innovative, and mastering virtual tools of education, as for the students he mentions that they must have the basic mastery of office tools and virtual tools.

On the other hand, in the information collected by the focus group applied to teachers, it was found that some teachers have had the experience of working online, not all, however, are willing to learn to be part of this process. Another relevant fact is that most teachers make use of and integrate ICT into their teaching work. In the same way, information was obtained from the students in the survey carried out, where many of the students would take the virtual distance modality as an option, they also express the use of technology for the benefit of their learning, although, some teachers consider that students are not making adequate use of technology, otherwise, It would make the students themselves have a better learning.

Until now, teachers do not have training focused on virtual distance education, therefore, the purpose must be pursued to succeed in the implementation of a new modality, therefore, the teacher plays an important role as a tutor, guide, and motivator of the student, presenting an attractive, dynamic, and innovative virtual learning environment. To do this, it is necessary to maintain permanent training, both in the technological and pedagogical fields, which motivates the student to explore and use online educational tools to achieve proposed objectives, where the student is the active promoter of their learning, developing basic skills in their daily lives.

In addition to this, in agreement with the expert on the most appropriate pedagogical model for the virtual distance modality, constructivism. Grajales (2013) states: "The teacher plays an important role as tutor, guide, and motivator of the student, presenting an attractive, dynamic and innovative virtual learning environment" and for this, he or she must remain in permanent training, both in the technological and pedagogical fields, which motivates the student to explore and use technological and innovative tools to achieve proposed objectives. where the student is the active promoter of their learning, developing basic competencies in their daily lives.

One of the experts in online education mentions that there is no recipe for knowing what instructional design to develop a virtual course, A second opinion mentions that it will depend on various elements such as the context in which it will be implemented, taking into consideration that reference is made to secondary education, the most important thing when considering a model is that in it the competencies can be resumed, However, Belloch (2000) highlights that ADDIE is the basic model of Instructional Design, such an instructional model would be of great help for the proposal of this study since the results of the formative evaluation of each phase can lead the instructional designer back to any of the previous phases.

Therefore, the instructional model that is proposed for the implementation of the virtual distance modality is the ADDIE model, because its simplicity allows people who do not have a preparation in technology to use it as a guide for the development of a program or course.

In curriculum design, it is conceived as a systemic process that establishes a relationship between learning theories and educational practice, all components are planned and worked on in close interrelation, selecting means and strategies that promote the construction and appropriation of learning.

The successful implementation of an online course does not depend solely on technical factors related to operational or aesthetic design, it involves determining human and pedagogical factors. For this reason, without pretending to be exhaustive, this proposal considers some of these aspects such as the design of the learning environment, its structure, the routine tasks, and the instructional model adopted.

Virtual tutoring training for High School teachers.

In the interview with the director of the Preparatory School, he states that a guiding course should be made for the correct and proper use of the virtual platform for teachers and students. The director maintains that it is necessary to hire a methodological advisor since he will be the one who knows technology and online education, in addition to hiring a teacher for each subject for the work of virtualization so that joint work is carried out with the specialist and the area teachers to guide them and have quality programs.

He adds that for this process that involves creating a new modality of study for the Preparatory School, the teacher in the face of education has to adapt in the best way with educational technology and currently virtual courses are part of modern technology, therefore teachers must be trained. He recommends that the student should be prepared, before implementing the virtual distance modality with the use of the platform, "It should be given as a workshop in which the student is facilitated access or the explanation of access, how they should navigate, how they should interact, how they should make use of the platform so that they do not have the limitation or that they do not have the technological knowledge and will not be able to carry out the tasks. tasks."

In the same way, the teachers made it known through the focus group, they stated that it would be good to guide them through an inductive course, for example, on how they can serve students online and that they should be prepared to do the virtualization of each course if virtual distance education is implemented in the Preparatory School. They consider that because they are teachers, they must be prepared for the different modalities of education.

Some teachers describe, based on the experience they have had with Saturday groups at UNAN, Managua, that younger students have more interaction with technology, while adult students do not know how to use the platform, the problem is that they did not know what a PDF file was or how to make a presentation. That's the problem with most students and that many may interact with technology but aren't using it correctly.

In this research, it was found that not all teachers are prepared to teach through the virtual distance modality and according to Juca (2016) refers that the virtual distance education modality requires the teacher to be trained and improved. However, teachers are willing to learn to achieve good results.

García (2014) states that one of the fundamental difficulties for teachers to assume their role in distance education is the contradiction between the traditional training they have received and the new context of education, therefore, a teacher training process is required for the implementation of this modality in Preparatory School.

In these spaces, the role of the teacher is conceived as a facilitator, a tutor who guides and orients the student, enabling social interaction and the construction of knowledge through instances of individual and group work and interaction with materials. For the proper functioning of a virtual teaching and learning environment, the important action of the tutor "virtual teacher" is required, who must keep the communicative spaces alive, facilitate access to content, encourage dialogue between participants, help them share their knowledge and build new knowledge, therefore, the teachers of the Preparatory School must receive training in virtual tutoring for the attention of the students. students in this modality, since although most have become familiar with different virtual learning environments, they have not had the experience of serving students in the virtual modality. (Belloch, n.d.)

CONCLUSIONS

- A diagnosis was made through SWOT analysis to identify the human and technological competencies of the Preparatory School, and among those found are access to the internet, the use of virtual platforms by teachers, either as tutors or students, many of them have mastery of computer tools that they integrate into the teaching and learning process, In addition, they are in constant training with information and communication technologies by the MINED and ProFuturo, they show enthusiasm to teach under the virtual distance modality.
- You should have the support of a pedagogical advisor in online education who accompanies teachers during this process. For teachers to be competent and for their teaching to be of quality, they must receive training, virtual tutoring, and the use of

the virtual learning environment to facilitate and enhance the learning process in the virtual distance learning modality.

- The proposed curricular design is developed in two stages, the macro planning which consists of establishing and describing in a general way the training program of the Preparatory School for young people and adults, and the micro-planning where the methodology for the organization of the contents is described through didactic planning, to give rise to the instructional design of the courses in the virtual distance modality.
- For the implementation of the virtual distance modality of the Preparatory School, the ADDIE instructional model was selected as an integral framework to guide the process of design, development, and implementation of educational programs integrating the use of virtual platforms, in addition, this model is one of the simplest and given its structure it can be worked by people who do not have experience in instructional models and allows a better organization in the methodology of work, where a series of instructions are established that contribute to the process of virtualization of the subjects.
- To improve the quality of teaching, a training program in virtual tutoring is proposed for the correct management of the learning of students of the virtual distance modality, this training will allow the training of competent and efficient teaching staff before the implementation of this modality in the Preparatory School. The training program includes content on the use of the virtual platform, based on the analysis of the diagnosis made to teachers.

BIBLIOGRAPHY

Belloch, C. (2000). Instructional Design.

García Aretio. (2014). Theoretical perspectives on distance and virtual education. Magazine

Spanish Journal of Pedagogy (249), 255-271.

Grajales, L. (2013). Virtual Education and Constructivism. Foundation for Updating Latin American Technology Companies.

Hammond, D. y Sykes, G. (2003). The Right Way to Meet the "Highly Qualified Teacher" challenge.

Heras, V., & Espinoza, A. (2015). The Digital Competencies of Future Teachers and their

Relationship with International ICT Standards. Ibero-American Journal of Academic Production and Educational Management.

Juca, F. (2016). Distance education, is a necessity for the training of students Professional. 8. Ecuador.