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Design process for a technological support model in the communicative mediations of a virtual program in Colombia

Proceso de Diseño para un modelo tecnológico de apoyo en las mediaciones comunicativas de un programa virtual en Colombia

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Abstract

This article, product of a research at the master's level at EAN University (2020) entitled: Design of technological model as a plan for the implementation of an optimal digital communication for the virtual program of Cidba at the University of Quindío, Colombia; developed by the authors, at the University mentioned above in 2019 and focused on: what type of technological application was relevant to maintain a fluid communication between students and teachers, since this is a continuous problem among the actors mentioned and factor of student desertion. For the investigation and collection of data, the qualitative-quantitative approach of research was used, through the implementation of a survey instrument. The results allowed to outline the design for a new virtual communication tool, supported under the Moodle platform, since this is the one that is used for teaching learning processes in the program object of study.

Keywords: *Communication, Higher Education, Platform, Technology, ICT, Virtuality*

Resumen

El presente artículo, producto de una investigación a nivel de maestría en la universidad EAN (2020) titulada: Diseño de modelo tecnológico como plan de implementación de una óptima comunicación digital para el programa virtual de CIDBA en la universidad del Quindío, Colombia; desarrollada por los autores, en la universidad antes mencionada en la vigencia 2019 y que se enfocó sobre: qué tipo de aplicación tecnológica era pertinente para mantener una comunicación fluida entre estudiantes y profesores, dado que este es un problema continuo entre los actores mencionados y factor de deserción estudiantil. Para la indagación y recolección de datos se apeló al enfoque cualitativo-cuantitativo de investigación, a través de la implementación de un instrumento de encuesta. Los resultados permitieron esbozar el diseño para una nueva herramienta virtual de comunicación, soportado bajo la plataforma Moodle, dado que esta es la que es utilizada para los procesos de enseñanza aprendizaje en el programa objeto del estudio.

Palabras Clave: *Comunicación, Educación Superior, Plataforma, Tecnología, TIC, Virtualidad.*

Introduction

The information society has had various changes: thus, the technological society, the digital society, in the age of connectivity are the expressions that characterize the global village in the twenty-first century, the internet and new technologies turn out to be a set of tools that develop and improve the economy, in politics, in education, the society in general, this involves a series of features complexity, virtuality, globalization, cultural diversity and the centrality of the presence of the Technologies of Information and Communication. Barrios, Parra, Siciliani, (2014, P. 5)

That is why education has received a permanent call to ensure comprehensive training by strengthening competences in the aspects of learning to know, learning to do, learning to be, learning to live together. In the Ibero-American field, it is called to establish the relationship of Information and Communication Technologies (hereinafter ICT) with the development in students of their ability to learn, to have a critical position in the information available on the Carneiro ET network. at. (2009).

Particularly Salinas, (2012, p. 1), argues that in the Ibero-American territory the perspectives of training in relation to teacher and student communication are not clear. In addition, teachers do not enter the field of technology either because of fear or lack of resources. In general, if you do not have an assertive communication between those involved, learning processes will not be effective, there will not be a theorization, a clear reflection, an essence, a scope and forward-looking teaching and learning, which leads to a mediocre education. One example of this situation is presented for the time of the development of this research, in academic programs at universities that do not have good mediations of communication between the teacher and the student due to the ignorance of the actors, in connection with the use and appropriation of digital platforms, among others (Zoom, Microsoft Team, Cisco Webex, Google Meet, among others) that allow them to maintain fluid communication and in this way respond promptly and effectively to the interlocutor of the process.

In the learning process it is necessary that the teacher-student communication is very fluid, mainly with this intention has been proposed the degree work. Work that was developed during the time period of 2018-2019. The work arose based on a specific research problem, which raises how to design a virtual communication tool for the implementation of new communicative mediations such as: Illuminate Live, WhatsApp, Facebook, You Tube, among others that allow optimizing the communication processes for teaching and learning of the Academic Program of CIDBA with its students.

To achieve the specific goals of the project is to investigate, identify and analyze the communication processes used by the program of information Sciences, Documentation, Librarianship and Archival science of the University of Quindio in Armenia, Quindio, Colombia to maintain a fluid communication with the students of the nine semesters assigned to this undergraduate academic program. The above, in order to design a virtual communication tool for the implementation of new communication mediations such as: Illuminate Live, WhatsApp, Facebook, You Tube, among others that allow optimizing the communication processes for teaching and learning of the Academic Program of CIDBA with its students.

The methodological process used was the qualitative-quantitative approach, through the use of surveys for students and teachers of the program. The analysis of the responses to the instrument used made it possible to infer the relevance of creating a virtual web of communication for the CIDBA program. In addition, various background research conducted in the context of virtual communication was reviewed and a broad epistemological framework was developed. In the areas related to pedagogy, didactics, teaching practices and the teaching and learning process, among other aspects related to educational (Barraza, 2018).

Materials and methods

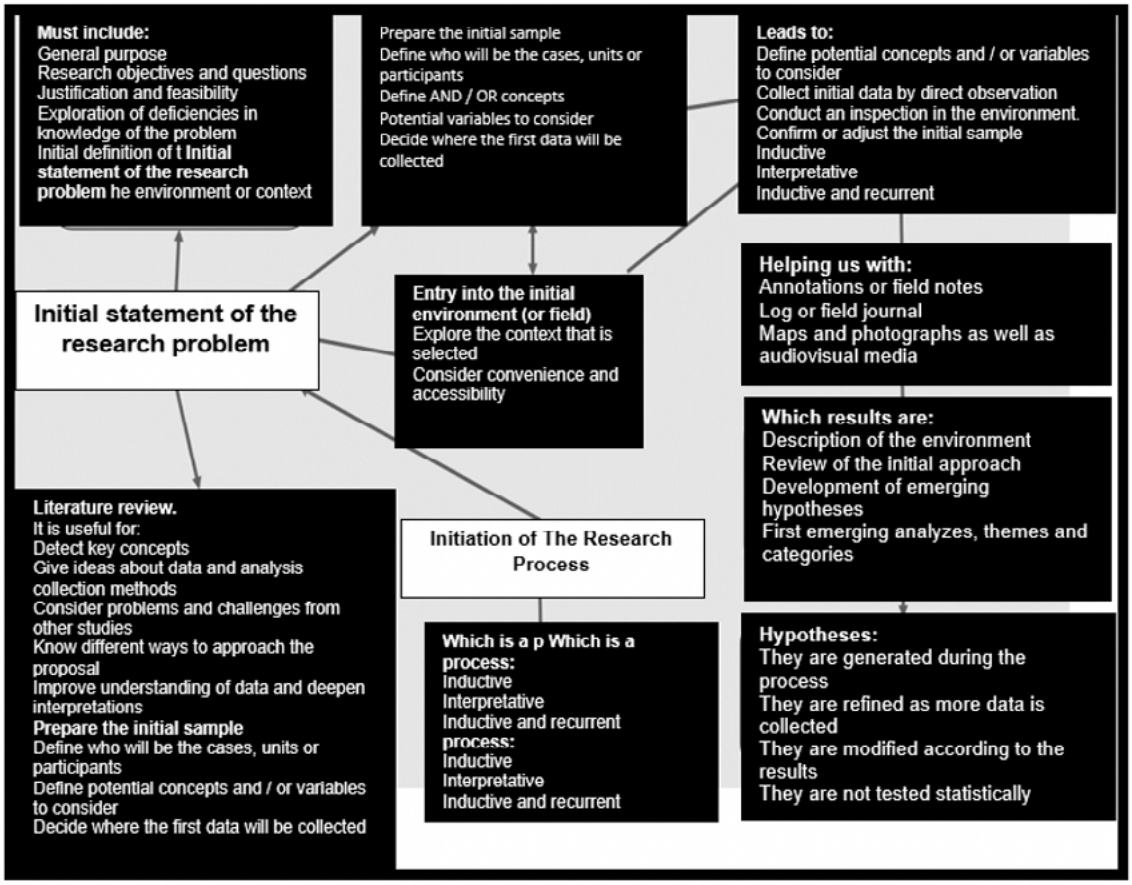
For the development of this research, it takes into account a Qualitative - Quantitative, Exploratory - Descriptive approach of Phenomenological type, as is expressed in the text Methodology of the Research, (Sampieri, 2014; González et al. 2020; Barragán et al. 2019): The qualitative research focuses on understanding phenomena, exploring them from the perspective of the participants in a natural environment and in relation with its context. The qualitative approach is selected when the purpose is to examine how individuals perceive and experience the phenomena around them, deepening their views, interpretations and meanings.

The qualitative approach is recommended when the subject of the study has been little explored or no research has been done on it in any specific social group Marshall, (2011) and Preissle, (2008). The qualitative process begins with the idea of research. Sampieri, Collado, and Bayptista, (2014). This research is phenomenological, since it limits its work to the processes and tools of communication that are used in an undergraduate academic program of the University of Quindio, called: Information Sciences, documentation, Librarianship and archival.

In relation to the research design and to answer the questions raised and develop the specific objectives proposed, the research was raised in three moments: plan, apply, verify-control Sampieri, et. At. (2014), each of the Communication processes and the Tools that can be applied in the program CIDBA and these phases were developed in three phases or stages with which it was intended to: Diagnose the processes and elements of synchronous communication, analyze the media that offers the Web 3.0, classify the systems of communication, systematize the information collected, assess the implementation of the technological tools identified, design an organizational model and technology that implement the communication systems and to Develop an action plan for the implementation of the Communication model

To improve synchronous and asynchronous communication with students, through the participation of each of them by a virtual survey tool that is sent to the students ' institutional mails. Consistent with the above, various activities proposed by Sampieri will be carried out, et. al, (2014), p. 357) as shown in the following image:

Figure 1. *Research activities*



Source: Sampieri, et, al. (2014), p. 357

Figure 1 shows each of the research activities that improve communication. Important point in virtual education teachers and students since it is vital the transmission of what you want to be understood.

In terms of the Population and sample, it was analyzed that the population universe that the university of Quindío company has in 2019 in the Academic Program of Undergraduate CIDBA is of 1099 students (In accordance with data supplied by the Program); for this study, we take a representative sample of 12% of the students, which corresponds to the inquiry by using an online survey to 132 of them, and to the 100% of the teachers Attached to the program, linked through plant or Contract Work as University Teachers. The population is represented by students and teachers of the CIDBA program.

For this purpose, several variables were defined, such as: communicational processes with virtuality of the program CIDBA, synchronous communication, asynchronous communication, and virtual communicative processes and Data Collection Instruments were applied to the selec-

ted student sample, who were sent a Virtual survey instrument that included 11 Multiple-Choice questions with variable option response (disagree, partially agree, agree, totally agree) in which, they inquired about the communication processes that they share with their teachers today and the means of ICT that are used for this purpose. Similarly, teachers (35 teachers) were applied a virtual survey consisting of 11 multiple-choice questions in which they will be consulted about the synchronous and asynchronous communication tools they use with their students.

Finally, in relation to the scope of the descriptive research work, it sought to understand from a diagnosis of the current situation of the technological processes and tools that are used in the cidba program for communication, the true impact for students, to the design of a web tool that allows improvement in the area.

Results

In order to answer the first specific Objective of this research work in relation with the need to diagnose the means of synchronous and asynchronous communication that has the program CIDBA and for contrast information between the question, the problem, the research methodology and the representative sample target of the inquiry, who through the application of the instrument allowed to observe the following results that allow to corroborate the hypothesis and the research questions that are configured as a problem of knowledge: in this sense, the goal of the diagnosis is to analyze and infer from the responses of the population sample for the verification of the art state in terms of how the digital communication synchronously and asynchronously is found between teachers and students in the program CIDBA of the University of Quindío.

The instrument developed made it possible to obtain data information and observe behaviors regarding the research questions proposed in this degree work and it was also necessary to confront the perceptions and opinions of teachers and students. The instrument has considered the following instructions for the respondent:

Read each question carefully.

Mark with this symbol (X) each of the criteria that correspond to your thought according to the question:

1: disagreement.	**Ds**
2: partially agree.	**Pa**
3: Agree.	**A**
4: Totally agree.	**Ta**

The questions of inquiry to teachers, were as follows:

Is communication with the student done instantly?

Is communication with the student only through text messages?

Do you permanently use media as chat?

Do learning strategies allow interaction through forums between teachers and students?

Is there feedback between teacher and student permanently?

Do you consider that knowledge, skills and values are sufficient, due to good communication between the people involved?

Does the student communicate permanently by email for communication with the teacher?

Have you been taken into account as a person despite educational mediation, in terms of the use of ICT?

Does the teacher use the different synchronous communication tools such as Google Meet or Zoom for video conferencing?

Are virtual platforms such as Moodle used to guide training?

Are you satisfied with pedagogical mediation assisted by new technologies?

The questions asked for the students were as follows:

Is communication with the teacher done instantly?

Is communication with the teacher only through text messages?

Does the teacher permanently use media as chat?

Do learning strategies allow interaction through forums between teachers and students?

Is there feedback between student and teacher permanently?

Do you consider that knowledge, skills and values are sufficient, due to good communication between the people involved?

Does the teacher communicate permanently by email for communication with the student?

Have you been taken into account as a person despite educational mediation, in terms of the use of ICT?

Does the teacher use the different synchronous communication tools such as Google Meet or Zoom for video conferencing?

Are virtual platforms such as Moodle used to guide training?

Are you satisfied with pedagogical mediation assisted by new technologies?

Statistical processing

Below, we show the percentage of the population subject to the research taking as references the number of students enrolled in the CIDBA program and the total number of teachers who present services to it; that is, we validate on a total of 1099 students and a total number of 32 teachers:

Table 1. *Percentage of target population of teachers*

Teachers	Percentage
35	100
35	X
	100%

Table 2. *Percentage of target population in virtual students*

Students	Percentage
1099	100
132	X
	12%

The questions used in the statistical instrument are then shown, followed by an analysis and discussion of the results.

Teacher surveys and response analysis

Q1: Is communication with the student done instantly?

Q2: Is communication with the student only through text messages?

Q3: Do you permanently use media as chat?

Q4: Do learning strategies allow interaction through forums between teachers and students?

Q5: Is there feedback between teacher and student permanently?

Q6: Do you consider that knowledge, skills and values are sufficient, due to good communication between the people involved?

Q7: Does the student communicate permanently by email for communication with the teacher?

Q8: Have you been taken into account as a person despite educational mediation, in terms of the use of ICT?

Q9: Does the teacher use the different synchronous communication tools such as Google Meet or Zoom for video conferencing?

Q10: Are virtual platforms such as Moodle used to guide training?

Q11: Are you satisfied with pedagogical mediation assisted by new technologies?

Table 3. *Questions results from 1 to 11 teachers*

Question N	Disagreement	Partially agree	Agree	Totally agree
Q1	Ds 23.1%	Pa 41%	A 25.6%	Ta 10.6%
Q2	Ds 15.4%	Pa 46.2%	A 25.6%	Ta 12.8%
Q3	Ds 15.4%	Pa 38.5%	A 35.9%	Ta 10.3%
Q4	Ds 28.2%	Pa 35.9%	A 25.6%	Ta 10.3%
Q5	Ds 30.8%	Pa 35.9%	A 20.5%	Ta 12.8%
Q6	Ds 33.3%	Pa 33.3%	A 23.1%	Ta 10.3%
Q7	Ds 17.9%	Pa 43.6%	A 28.2%	Ta 10.3%
Q8	Ds 38.5%	Pa 33.3%	A 17.9%	Ta 10.3%
Q9	Ds 30.8%	Pa 30.8%	A 28.2%	Ta 10.3%
Q10	Ds 25.6%	Pa 33.3%	A 30.8%	Ta 10.3%
Q11	Ds 28.2%	Pa 41%	A 20.5%	Ta 10.3%

Student inquiry and answer analysis

Q1: Is communication with the teacher done instantly?

Q2: Is communication with the teacher only through text messages?

Q3: does the teacher permanently use media as chat?

Q4: do learning strategies allow interaction through forums between students and teachers?

Q5: Is there feedback between student and teacher permanently?

Q6: Do you consider that knowledge, skills and values are sufficient, due to good communication between the people involved?

Q7: does the teacher communicate permanently by email for communication with the student?

Q8: Have you been taken into account as a person despite educational mediation, in terms of the use of ICT?

Q9: Does the teacher use the different synchronous communication tools such as Google Meet or Zoom for video conferencing?

Q10: Are virtual platforms such as Moodle used to guide training?

Q11: Are you satisfied with pedagogical mediation assisted by new technologies?

Table 4. *Question results 1 to 11 students*

Question N	Disagreement	Partially agree	agree	Totally agree
Q1	Ds 37.9%	Pa 38.6%	A 12.1%	Ta 11.4%
Q2	Ds 37.9%	Pa 44.7%	A 10.6%	Ta 6.8%
Q3	Ds 25.8%	Pa 45.5%	A 17.4%	Ta 11.4%
Q4	Ds 23.5%	Pa 45.5%	A 18.2%	Ta 12.9%
Q5	Ds 29.5%	Pa 41.7%	A 15.2%	Ta 13.6%
Q6	Ds 29.5%	Pa 43.9%	A 15.9%	Ta 10.6%
Q7	Ds 29.5%	Pa 42.4%	A 15.9%	Ta 12.1%
Q8	Ds 30.3%	Pa 39.4%	A 21.2%	Ta 9.1%
Q9	Ds 24.2%	Pa 38.6%	A 20.5%	Ta 16.7%
Q10	Ds 28.8%	Pa 40.9%	A 16.7%	Ta 13.6%
Q11	Ds 28.8%	Pa 43.2%	A 17.4%	Ta 10.6%

Discussion of results

According to the question, is communication with the student done instantly? 41% of the respondents agree that they partially agree with the instant communication between teacher and student; additionally, 25.6% agree that the communication is done instantly and as a complement to the data obtained, 23.1% disagree and in contrast to only 10.33% fully agree. Therefore,

it appears from the sample that it is necessary to strengthen communication between students and teachers quickly.

Now the question, Is communication with the student only through text messages? 46.2% of respondents agree that communication with the student is done only by text message; additionally, 25.6% agree that communication is done only by text messages, as a complement to the data obtained 15.4% disagree and in contrast to only 12.8% fully agree. Therefore, according to the sample, it is necessary to carry out communication not only by text messages but by other means.

Also, with the question, do you permanently use media as chat? 38.5% of respondents partially agree that they use chat permanently; additionally, 35.9% accept chat is used permanently as a mean of communication, as a complement to the data obtained 15.4% disagree and in contrast to only 10.3% fully agree. Therefore, it appears from the sample that it is necessary to strengthen communication through the media a little more.

Continuing with the question, do learning strategies allow interaction through forums between teachers and students? 35.9% of respondents partially agree that learning strategies allow interaction with forums between teachers and students; additionally, 28.2% disagree that there is interaction with forums between teachers and students, as a complement to the data obtained, 25.6% agree and in contrast to only 10.3% fully agree. Therefore, the sample indicates that there is a need to strengthen learning strategies.

Next, the question, Is there feedback between teacher and student permanently? 35.9% of respondents partially agree that there is permanent feedback; additionally, 30.8% disagree that there is permanent feedback, as a complement to the data obtained 20.5% agree and in contrast to only 12.8% fully agree. Therefore, it appears from the sample that there is a need to strengthen feedback between teachers and students.

Continuing with the question, do you consider that knowledge, skills and values are sufficient, due to good communication between the people involved? 33.3% of respondents partially agree that knowledge and skills are sufficient due to good communication; additionally, 33.3% disagree that there is good knowledge due to good communication between those involved, in addition to the data obtained, 23.1% agree and in contrast to only 10.3% fully agree. Therefore, it appears from the sample that there is a need to strengthen communication among those involved.

Following with the question, Does the student communicate permanently by email for communication with the teacher? 43.6% of the respondents partially agree that the student is permanently communicated with the teacher; additionally, 28.2% agree that the participants are permanently communicated by mail, in addition to the data obtained, 17.9% disagree and in contrast to only 10.3% fully agree. Therefore, according to the sample, it seems necessary to strengthen communication by mail permanently between those involved.

Looking at the question, have you been taken into account as a person despite educational mediation, in terms of the use of ICT? 38.5% of respondents disagree that it has been taken into

account despite educational mediation with the use of ICT; additionally, 33.3% partially agree that they have been taken into account, as a complement to the data obtained, 17.9% agree and in contrast to only 10.3% fully agree. Therefore, it appears from the sample that those involved in the ICT-mediated education process have not been taken into account.

Reviewing the question, Does the teacher use the different synchronous communication tools such as Google Meet or Zoom for video conferencing? 30.8% of respondents partially agree that they use synchronous communication tools; in addition, 30.8% disagree on the use of means for synchronous communication, as a complement to the data obtained, 28.2% agree and in contrast to only 10.3% fully agree. Therefore, it appears from the sample that it is important to strengthen the use of different synchronous communication tools.

And now the question, are virtual platforms such as Moodle used to guide training? 30.8% of respondents partially agree that they use virtual platforms for training; in addition, 30.8% disagree on the use of virtual platforms for training, as a complement to the data obtained, 25.6% disagree and in contrast to only 10.3% fully agree. Therefore, it appears from the sample that it is important to strengthen the use of virtual platforms to guide training.

The question, are you satisfied with the pedagogical mediation assisted by the new technologies? 41% of respondents partially agree that they are satisfied with the pedagogical mediation assisted by new technologies; in addition, 28.2% disagree with the satisfaction of the use of platforms for training, as a complement to the data obtained, 20.5% agree and in contrast to only 10.3% fully agree. Therefore, they appear not to be satisfied with the mediation assisted by new technologies.

Student Survey

According to the question, is communication with the teacher done instantly? 38.6% of the respondents partially agree that they partially agree with the instant communication between teacher and student; additionally, 37.9% disagree that the communication is done instantly and as a complement to the data obtained, 12.1% agree and in contrast to only 11.4% fully agree. Therefore, it appears from the sample that it is necessary to strengthen the communication between students and teachers quickly.

Now the question, Is communication with the teacher only through text messages? 44.7% of respondents agree that communication with the student is done only by text message; additionally, 37.9% disagree that communication is done only by text messages, as a complement to the data obtained 10.6% agree and in contrast to only 6.8% fully agree. Therefore, according to the sample, it is necessary to carry out communication not only by text messages but by other means.

Also, with the question, do you permanently use media as chat? 45.5% of respondents partially agree that they use chat permanently; additionally, 25.8% disagree that chat is used permanently as a mean of communication, as a complement to the data obtained 17.4% disagree and in contrast to only 11.4% fully agree. Therefore, it appears from the sample that it is necessary to strengthen communication through the media a little more.

Continuing with the question, do learning strategies allow interaction through forums between teachers and students? 45.5% of respondents partially agree that learning strategies allow interaction with forums between teachers and students; additionally, 23.5% disagree that there is interaction with forums between teachers and students, as a complement to the data obtained, 18.2% agree and in contrast to only 12.9% fully agree. Therefore, it appears from the sample that there is a need to strengthen learning strategies.

And now, the question, Is there feedback between student and teacher permanently? 41.7% of respondents partially agree that there is permanent feedback; additionally, 29.5% disagree that there is permanent feedback, as a complement to the data obtained 15.2% agree and in contrast to only 13.6% fully agree. Therefore, according to the sample, it is necessary to strengthen feedback between students and teachers.

Observing the question, do you consider that knowledge, skills and values are sufficient, due to good communication between the people involved? 43.9% of respondents partially agree that knowledge and skills are sufficient due to good communication; additionally, 29.5% disagree that there is good knowledge due to good communication between those involved, in addition to the data obtained, 15.9% agree and in contrast to only 10.6% fully agree. Therefore, it appears from the sample that there is a need to strengthen communication among those involved.

Following with the question, does the teacher communicate permanently by email for communication with the student? 42.4% of the respondents partially agree that the student is permanently communicated with the teacher; additionally, 29.5% disagree that the participants are permanently communicated by mail, as a complement to the data obtained, 15.9% agree and in contrast to only 12.1% fully agree. Therefore, according to the sample, it seems necessary to strengthen communication by mail permanently between those involved.

Based on the question, have you been taken into account as a person despite educational mediation, in terms of the use of ICT? 39.4% of respondents disagree that it has been taken into account despite educational mediation with the use of ICT; additionally, 30.3% partially agree that they have been taken into account, as a complement to the data obtained, 21.2% agree and in contrast to only 9.1% fully agree. Therefore, it appears from the sample that those involved in the ICT-mediated education process have not been taken into account. Looking at the question, Does the teacher use the different synchronous communication tools like Google Meet or Zoom for video conferencing? 38.6% of respondents partially agree that they use synchronous communication tools; in addition, 24.2% disagree on the use of means for synchronous communication, as a complement to the data obtained, 20.5% agree and in contrast to only 16.7% fully agree. Therefore, it appears from the sample that it is important to strengthen the use of different synchronous communication tools. Based on the question, are virtual platforms such as Moodle used to guide training? 40.9% of respondents partially agree that they use virtual platforms for training; additionally, 28.8% disagree on the use of the platform for training, as a complement to the data obtained 16.7% agree and in contrast to only 13.6% fully agree. Therefore, it appears from the sample that it is important to strengthen the use of virtual platforms to guide training.

In conclusion to the question, are you satisfied with the pedagogical mediation assisted by the new technologies? 43.2% of respondents partially agree that they are satisfied with the pedagogical mediation assisted by the new technologies; in addition, 28.8% disagree with the satisfaction of the use of platforms for training, as a complement to the data obtained 17.4% agree and in contrast to only 10.6% fully agree. Therefore, they appear not to be satisfied with the mediation assisted by new technologies.

Software design

" Software design is a process by which a specification of a software artifact is performed where objectives are met with the help of different components and/or constraints " Braude, (2014). It is important for this research work because through this process is conceptualized, framed, implemented, and put into operation the application object of the same. It usually involves a vision or definition of software solutions where one of the main components is the analysis of software requirements that allow listing the specifications used in software engineering. Below, we present the different illustrations that are related to the design of the application that allows communication between teachers and students of the CIDBA program.

Software design of the proposed application, called Network Communication (Comnet).

Figure 2. *Initial connection*

Figure 3. *Group communication*

Figure 4. *Document reception*

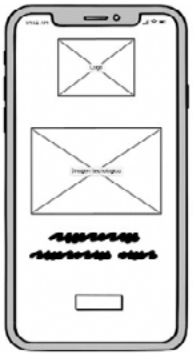
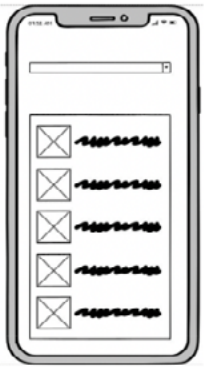


Figure 5. *Document organization*



Design with graphic environment of the proposed application, called Network Communication (Comnet): with this application it is possible to optimize the communication between teachers and students of the CIDBA program, since it combines various technological and technical elements, with which can be realized in real time, various interactions and interactivities, of synchronous type to solve doubts and expectations that have the actors of the process.

Figure 6. *Corporate aspects of the app*

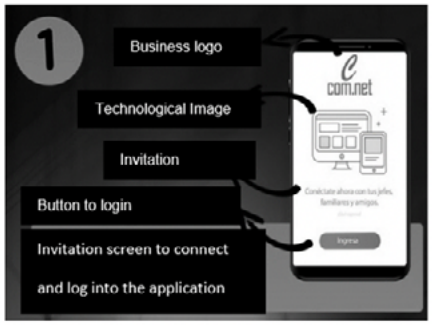


Figure 7. *User login environment*

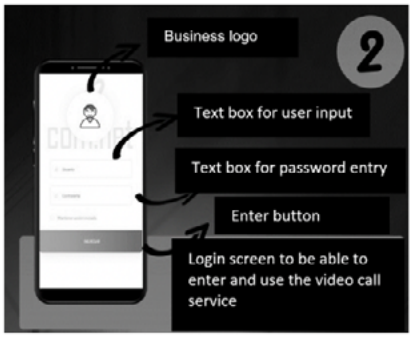


Figure 8. *Saved contacts screen*

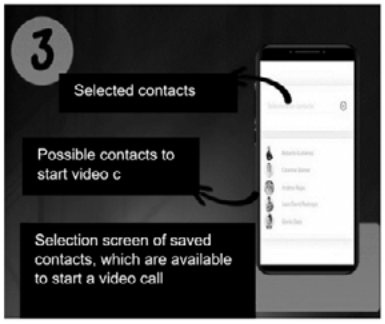


Figure 9. *Active contact screen*

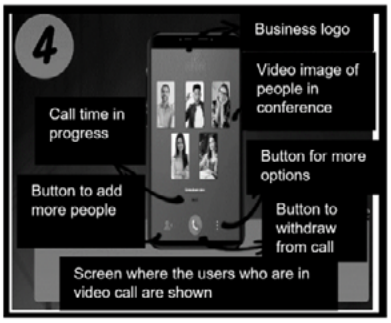
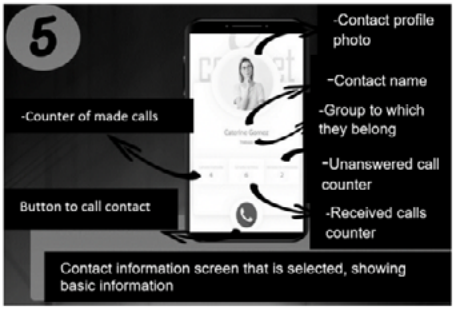


Figure 10. *Contact information*



Strategic Plan: for the design of a strategic plan that allows a more suitable digital communication to be used between students and teachers of the CIDBA program, it was necessary to plan 3 moments to know

Moment 1 socialization with cidba program directives in relation to the new web application design for teachers and students application to improve their communicative processes of the program

Moment 2: socialization meeting with teachers of the virtual training program to make condensation of contributions and suggestions in relation to the new communication web application for the CIDBA program.

Moment 3: virtual meeting with students of the CIDBA program to know the acceptance and use of the new web application for synchronous and asynchronous communication of the CIDBA program

Intervention Plan: in order to develop an intervention plan and recommendations to the CIDBA program for the application of the technological model proposed in the research work, 2 phases were developed, which are:

Phase 1 Reflection on Communication strategies: Taking into account the results displayed through the process of exchange of information with the target population, it was raised from this study the need to create strategies to improve and strengthen the communication between the actors of the pedagogical process often using e-mail, messaging, chat, different tools of communication synchronous and asynchronous, immediate communication with the student. Consistent with the above, it is necessary to reflect on aspects such as: (Need) Plan and action. Evaluation of social projects. Goal... objectives (indicators) product effects results and impacts effectiveness efficiency and efficacy how the money is not an impediment to communication need to pay the virtual in the same way as a teacher in person.

Phase 2: Steps to be taken into account for the design, implementation, and evaluation of a technological model: Taking into account the results of the proposed research, it is necessary and it is clear from the data that throws the same the creation of strategies that enhance the communication and educational issues among teachers and students in the program CIDBA; that is to say, that you should take into account the design, implementation and evaluation of a technological model or a platform that when implemented will optimize the features and functions of the digital communication to the virtual program of CIDBA at the university of Quindio, Colombia. In other words, the research process clearly demonstrates the need to incorporate an application that improves the synchronous and asynchronous communication of teachers and students, so that the proposed system should at least have the following characteristics or allow an approach to them.

It is also important to take into account such aspects as:

- Knowledge, rapprochement and communication among the research population.
- Integrate with the substantive functions of the training exercise of the CIDBA program, including teaching, research and social projection.

- Improve experiences in the management of ICT-mediated educational tools.

Conclusion

The research proposal makes it possible to differentiate the assessments of the target population in terms of effectiveness, efficiency and efficacy of synchronous and asynchronous communication, since they affect the learning process. In addition, it allowed to diagnose about the digital means of synchronous and asynchronous communication, which are used in the academic space of the CIDBA program.

In the same sense, it was possible to propose a strategic plan to allow the ideal digital communication between students and teachers through the Moodle platform and thus establish mechanisms for more active participation for the development of interactions and interactivities in the CIDBA program.

Finally, it was possible to identify digital communication as a relevant part of ICT-mediated training is essential for a Virtual program such as Information Science, Documentation, librarianship and archival, as it maximizes the opportunity for educational actors to have feedback information about their academic activities more promptly.

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