

# MENDIVE



## REVISTA DE EDUCACIÓN

*Translated from the original in Spanish*

### Mobile devices as an online learning scenario in virtual conditions

### Los dispositivos móviles como escenario de aprendizaje en línea en condiciones de virtualidad

### Dispositivos móveis como cenário de aprendizagem online em condições virtuais

Hidekel Nápoles Díaz<sup>1</sup>



<http://orcid.org/0000-0002-7594-6816>

Elena Sobrino Pontigo<sup>1</sup>



<https://orcid.org/0000-0002-9851-2869>

Roberto Carlos Rodríguez Hidalgo<sup>1</sup>



<https://orcid.org/0000-0001-5078-5246>

<sup>1</sup>University of Sancti Spiritus "José Martí Pérez". Cuba.



[hnapoles@uniss.edu.cu](mailto:hnapoles@uniss.edu.cu),  
[esobrino@uniss.edu.cu](mailto:esobrino@uniss.edu.cu),  
[rcarlos@uniss.edu.cu](mailto:rcarlos@uniss.edu.cu)

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#### ABSTRACT

Technological advances arise in response to information and communication needs. For this reason, mobile devices appear as a new social, cultural and educational paradigm that cannot go unnoticed in higher education, which aims to be inclusive and attached to technologies. The mobile phone, tablets, laptop are not only for social networks and the internet, but they can be used in multitudes of settings from an educational perspective. It does not mean that we should allow their uncontrolled use, but rather consider the possibilities they offer, since in various centers their use is prohibited, trends that go precisely in the opposite direction. The objective of this predominantly quantitative research is to present the results of an exploratory study with a descriptive approach about the use and disposition expressed by students and teachers with mobile devices as scenarios for learning in virtual conditions.

**Keywords:** mobile devices; learning scenario; teaching-learning process; virtualization.

#### RESUMEN

Los avances tecnológicos surgen como respuesta a necesidades de información y comunicación. Por esta razón aparecen los dispositivos móviles como un nuevo paradigma social, cultural y educativo que no puede pasar inadvertido en la Educación Superior, la cual pretende ser inclusiva y apegada a las tecnologías. El teléfono móvil, el tablet, las laptops no solo son para redes sociales e internet, sino que pueden ser utilizados en diferentes escenarios desde una perspectiva educativa. No significa que se deba permitir su uso sin control, sino que se consideren las posibilidades que brindan, pues en diversos centros se prohíbe su uso, tendencia que va precisamente en dirección opuesta. El objetivo de este artículo es exponer los resultados de un estudio exploratorio con enfoque descriptivo acerca

del uso y la disposición que manifiestan estudiantes y docentes en cuanto a los dispositivos móviles como escenarios para el aprendizaje en línea. En la investigación se emplearon métodos teóricos, empíricos y estadísticos, así como instrumentos asociados a ellos. Los resultados dan evidencia de las potencialidades y riesgos que traería su uso en estudiantes y docentes de primer año de la carrera Licenciatura en Educación Informática de la Universidad de Sancti Spíritus "José Martí Pérez".

**Palabras clave:** dispositivos móviles; escenario de aprendizaje; proceso de enseñanza- aprendizaje; virtualización.

## RESUMO

Os avanços tecnológicos surgem em resposta às necessidades de informação e comunicação. Por esta razão, os dispositivos móveis surgem como um novo paradigma social, cultural e educacional que não pode passar despercebido no Ensino Superior, que pretende ser inclusivo e ligado à tecnologia. O celular, o tablet, os laptops não servem apenas para as redes sociais e a internet, mas podem ser utilizados em diferentes cenários do ponto de vista educacional. Isso não significa que seu uso deva ser permitido sem controle, mas sim que as possibilidades que eles oferecem devem ser consideradas, já que em vários centros seu uso é proibido, tendência que vai justamente na direção oposta. O objetivo deste artigo é apresentar os resultados de um estudo exploratório com abordagem descritiva sobre o uso e a disposição que alunos e professores expressam em relação aos dispositivos móveis como cenários de aprendizagem online. Na pesquisa foram utilizados métodos teóricos, empíricos e estatísticos, bem como instrumentos a eles associados. Os resultados evidenciam as potencialidades e riscos que seu uso traria em alunos e professores do primeiro ano da carreira de Bacharel em Educação Informática da

Universidade de Sancti Spíritus "José Martí Pérez".

**Palavras-chave:** dispositivos móveis; cenário de aprendizagem; processo de ensino-aprendizagem; virtualização.

## INTRODUCTION

Technological advances, and in particular Information and Communication Technologies (ICT), are a valuable resource capable of contributing to education. In response to the current needs of society, an important element is virtualization. At the same time, it constitutes an essential component in its management, in accordance with the demands of a quality higher education, in correspondence with its mission or social function, capable of dealing with the growing volume of information and knowledge that must be acquired and make possible the improvement of face-to-face and virtual training processes for students.

The virtualization of higher education not only implies the technological support of its processes, but it goes much further; its essential objective leads to transform the disciplines, the role of the teacher, the student and the educational institution itself, although it is not the technologies that vary the processes, but the way in which they are used for the sake of a transformative result, flexible and student-centered, which demands changes in the mentality and practices of teachers towards a new training. In this sense, Guerrero *et al.* (2020) points out that ICTs become alternatives and tools par excellence to successfully face the circumstances of society and respond to educational systems, in times of confinement. In turn, the modalities of education or digital teaching have gained a new impetus as a result of the closure of the

physical campuses of universities, caused by COVID-19 (Ferdiget *al*, 2020).

In this regard, it is pointed out that COVID-19 modified teaching methods in the world, classrooms are empty, students and teachers changed a physical space for a virtual one, demanding and putting their knowledge to the test. From this event, education changed its form of management and presence without losing its substantial training essence (García-Peñalvo *et al.*, 2020). From this it follows that the teacher has the knowledge, skills and resources necessary to carry out a quality online teaching process, and not only pay attention to the fulfillment of scheduled tasks, but also keep in mind the emotional affective sphere of the student (Guerrero *et al.*, 2020); although it is true that students and teachers must evolve towards a much more dynamic and collaborative training (Cabero & Barroso, 2016).

On this point, it is considered that the challenges posed by the pandemic forced the process of virtualization and development of computerization. Therefore, in this scenario, teachers and students take on a great challenge, especially those accustomed to the traditional method; because in them an accelerated didactic renovation is imposed for the use of mobile devices, considered by many as the scenarios for online learning. Therefore, the questioning made by the authors of this article about the preparation of all the actors in the online teaching-learning process, and in particular of the students, is logical.

All of the above allows us to argue that the incorporation of mobile devices is characterized by expanding access to education, promoting collaborative online learning and creating student-centered learning communities; therefore, learning becomes an active process and not a simple reception and memorization of information, where the teacher acquires a role of

facilitator or conductor of learning with equity and inclusion, however, the student is responsible for their learning as an entity in the knowledge society (Castro & González, 2016).

Cuba, like the rest of the countries, with the arrival of mobile devices has witnessed the emergence of a new generation called digital natives, who demand higher requirements. Technological change has reached an unprecedented pace, it can seem almost impossible to imagine what learning will be like several years from now; however, the future will depend on the decisions made today, with the due support and will of the main leaders, already manifested in the 2030 sustainable development agenda, in order to achieve quality education.

According to the diagnostic study carried out by the authors of this article, derived from an investigation, it is evident that mobile devices for personal use have entered the university institution and occupy the attention of the students, since this is the teaching in which it is evidenced greater use and interactivity with these media; but, without a doubt, the centers still have not evolved at the same pace as the advancement of technology, and teachers do not always have or take advantage of the potential they offer to turn them into learning scenarios.

In this regard, the trends regarding this theme diverge, that is, they are divided: some state that they agree with the student taking these devices to the institution as a means of accompaniment, others focus on virtual learning and some consider it a distraction; although the reality is that they are here to stay and most students in one way or another carry them with them, which does not ensure that they are skilled in their proper use (Acosta-Silva, 2016).

In contrast to the above, the authors of this article found difficulties in the course, in

terms of mobile devices, in particular their use as a scenario for online learning; These start from the availability, disposition, mastery and skills necessary for their correct use in students and teachers, so that, taking into account these considerations, the objective of this article was proposed: to present the results of an exploratory study with a descriptive approach about the use and the disposition manifested by students and teachers of mobile devices as scenarios for online learning. With this intention, a response is given to the educational demand of the 21st century (Basanteset *al.*, 2017).

## MATERIALS AND METHODS

The article is derived from an investigation that exposes the result of an exploratory study with students and teachers of the first year of the Bachelor of Computer Education career, where the need to favor online learning with the use of devices has been evidenced. phones, as they are considered motivating and attractive to students and, although their use is prohibited, students manage to take them to the classroom (Nápoles *et al.*, 2019).

For the collection of information and references, a bibliographic search was carried out in high-impact journals, indexed in the different databases, among them: Scopus, Scielo, Ebsco, Google Scholar, as well as in institutional repositories, where approximately 40 references of the last eight years, about the use of mobile devices for learning in Higher Education were obtained.

Taking into account the peculiarities of the phenomenon under investigation, the context, as well as the exchange with the subjects involved, the authors considered it pertinent to use the research methodology with a dialectical-materialist approach, based on the use of different methods; among the theoreticians: the analytical-synthetic, in the

verification and development of the fundamentals that support the use of mobile devices for student learning; the historical-logical, made it possible to analyze the antecedents of the historicity in the use of mobile devices for learning in the first year students of the career and teachers of the University of Sancti Spíritus "José Martí Pérez", by facilitating the knowledge, trajectory and historical evolution of this phenomenon; the inductive-deductive, which allowed the analysis and processing of all the information and the current assessment of the problem in the sample.

Different empirical methods were used: interviewing teachers, to verify the level of use and preparation they have about mobile devices for learning; the analysis of documents allowed obtaining information about guidelines issued by the higher body on the use of technologies in the teaching-learning process; The survey was applied to verify the knowledge that students have of mobile devices, the use they give them and the will to use them and thereby favor learning in virtual conditions.

Mathematical and statistical methods were also used: the percentage calculation, for the verification, organization and quantitative interpretation of the applied instruments, as well as the Microsoft Excel electronic tabulator in the interpretation of tables and graphs.

For the descriptive, exploratory study, with a predominantly quantitative approach, three stages were declared:

Stage 1. Selection of teachers and students as a sample, as well as technical methods and research instruments.

Stage 2. Application of instruments in the selected samples.

Stage 3. Statistical processing and mathematical analysis of the data.

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The population studied is made up of 156 students of the Bachelor of Computer Education degree and the 23 students who belong to the second academic year of the daytime course were selected as an intentional sample, which represent 15% of the population and the ten teachers of the career itself, with the aim of using informants oriented towards the analysis of the teaching-learning process with the use of mobile devices.

The determined dimensions were the following:

**Dimension 1.** Cognitive: level of knowledge about mobile devices

#### **Indicators**

- 1.1 Mastery of communication tools
- 1.2 Domain of academic management tools
- 1.3 Domain of personal management tools

**Dimension 2.** Procedural: level of development of skills for the practical application of mobile devices

#### **Indicators**

- 2.1 Mastery of skills for interaction and knowledge management with mobile devices
- 2.2 Mastery of procedures for viewing and downloading files online
- 2.3 Mastery of procedures for the presentation of tasks, development of exams and visualization of qualifications

For the aforementioned diagnosis in the students, a group of instruments was applied, such as: the survey, the analysis of the product of the activity and an evaluative scale containing seven items, to determine the high, medium and low level about the use

of the mobile devices in the online teaching-learning process; Other instruments were applied to the sample of selected teachers, such as: the survey, the interview and the observation of classes. For the validation of each instrument, the criteria and assessments of three experts in this area of knowledge from the University of Sancti Spíritus "José Martí Pérez" were taken into account.

## **RESULTS**

The volunteer participants responded to the researchers' request to explore their experiences using mobile devices. The inclusion criteria admit all the selected students, since they show features of collaborative group work and, above all, a willingness to learn. The exclusion criteria are content of the opposition of those students refused to participate, which in this investigation does not contemplate any.

Of the 23 selected students, 10 (43.4%) are male and 13 (56.5%) are female; their ages are between 17 and 20 years old, all confirm the possession of some mobile device of their property. A total of 10 teachers, including directors, were interviewed. The research is based on a materialist-dialectical conception, which takes into account the characteristics of education as a historical-social phenomenon, where the theoretical and the empirical complement each other.

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**Table 1-** Mobile devices owned by students and teachers

Mobile devices	Students (23)		Teachers (10)	
	Total	%	Total	%
They have a mobile phone		100%	9	90%
have a laptop	15	65.2%	2	20%
They have tablet	7	30.4%	1	10%

The data presented in table 1 reveals the number and percentage of mobile devices owned by the students and teachers of the selected sample. It is evident that the 23 students and the 10 teachers (100%) have a mobile device; i.e., phone, laptop or tablet. This indicates that the possibilities offered by the students' own devices can be taken advantage of, in the class and outside of it, under their consent and disposition, as well as the permanent improvement of the teachers for the incorporation of these devices into the teaching process. learning. According to different authors, young people know about technology, but they need to be guided, trained and oriented so that these tools become an educational fact (Pérez, 2018).

Based on the above, the results of the survey applied to students are presented, with the aim of verifying the possession and use of mobile devices as an online learning scenario. In relation to the analysis of the first question about the possession of a device and its classification, the answer appears in table 1. Regarding the second question that questions the authorization by the teacher of mobile devices for personal use in face-to-face teaching activity, it was assessed that 15 students, representing 65.2%, reflect that they have never been allowed to use mobile devices in the classroom, while eight students (34.7%) marked option A times.

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Regarding the third question, which addressed willingness, the 23 students (100%) declared interest and willingness to use them in virtual conditions. In the fourth question, where they were asked to answer for what purpose they use mobile devices, they indicated the following: 10 students (43.4%) reflected their use for bibliographic consultations and independent studies, eight students (34.7%) revealed that they use them for communication purposes and five students (21.7%) expressed using them for leisure only. In the analysis of the fifth question, related to the phrases or expressions issued by teachers regarding mobile devices, it was observed that 100% of the sample agreed to have heard the following:

- They can't use the devices during the conference...
- If someone brings it, they leave it saved...
- Forbidden to record the teacher or take photos of the content on the blackboard...
- Mobile devices are for home, not for class...

Finally, it was appreciated in the analysis of the results of the survey applied to students that, despite the use of media in the teaching-learning process and in particular technologies being legally recognized, its use by the collective is still insufficient and limited. career teacher.

Based on the ideas presented, an assessment scale was applied to the sample of selected students, with elements about the use of mobile devices in the online teaching-learning process. To obtain the results, the Likert method was used and its analysis comprises a group of items according to the problem investigated.

**Table 2-** Assessment scale.

No.	items	Under	%	Means, medium	%	High	%
1	online forums	13	56.5%	10	43.5%	-	-
2	chat rooms	8	34.7%	15	65.2%	-	-
3	Upload assignments to LMS Moodle	20	86.9%	3	13.0%	-	-
4	Solve quizzes	18	78.2%	5	21.7%	-	-
5	Bibliography Downloads	2	8.6%	-	-	21	91.3%
6	Gamification	23	100%	-	-	-	-
7	E-mail	-	-	-	-	-	100%

The results of the evaluation scale, reflected in Table 2, showed a marked tendency in the low level (56.5%) in the first item; however, there were students who were located in the medium level (43.5%) and in the high level no students were confirmed.

This showed shortcomings in terms of the use of *online forums*, through mobile devices. Regarding the second item, concerning the usefulness of chat rooms, it marked a location of 34.7% in the low level and a higher trend in the medium level with 65.2%, contrasting a better use of this resource for online learning with mobile devices.

Of equal importance, the third item showed a significant difference, with the low level being located at 86.9% over the average level with only 13.0%, which showed low use

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of mobile devices to access the institutional LMS Moodle and upload teacher-directed tasks. In the same way, the fourth item, which dealt with the resolution of online questionnaires, showed the majority and a higher tendency in the low level, with 78.2%, which is why it differs significantly from the rest of the students who were in the lower level. medium level, with 21.7%.

In contrast to the above, the fifth item about online bibliographic downloads, obtained 8.6% at the low level and 91.3% at the high level. Likewise, regarding the gamification located in the sixth item of table 3, it reflected the total number of students in the low level, with 100%, which transcended as a negative element from the applied instrument and, finally, in the Concerning the seventh item about the use of E-mail, the results were very positive, as the high level was located at 100%. In this way, in the analysis of the results obtained through the application of this instrument, the seriousness and commitment of the students with research in the use of mobile devices for online learning was reflected as a positive element.

As a follow-up to the exploration, the analysis method of the product of the learning activity was also applied to the students, conceptualized as the practical application of mobile devices. To obtain the results, four other items were proposed that corroborate the above.

1. information management
2. Content editing
3. Communication with other devices
4. Use of social web

The conclusions derived from the results obtained in the application of this instrument showed that, regarding the first item, only 11 students, 47.8%, used these devices for

information management or study activity. Regarding the second item, it was observed that nine students, representing 39.1%, edited content through the use of mobile devices; the rest only showed interest through desktop or desktop computers, which showed that this group of students did not attribute importance and need to these media for content editing, in regard to the use of bibliographic managers, translators, among others.

Likewise, it was found that 86.9%, that is, 20 students, demonstrated skills for communication between mobile devices; in other words, the link between them through the Bluetooth, WhatsApp or Zappya tools in their different versions for the transmission of data or information, but it is not only about the level of use, but about harmonizing the academic and personal for the sake of improve the online teaching-learning process through mobile devices as a scenario. The same happens with the fourth item, which addressed the use of the social web, 100% of the total number of students indicated a high level of utility and mostly for leisure purposes; that is, for the game, listening to music on the internet, videos and the most used networks were Facebook, Instagram and WhatsApp.

Through this instrument, the existence of a group of students who require high levels of development in the use of mobile devices was verified; instead, another group of students, representing 50% of the sample, was observed, reflecting insufficiencies in the items Information management and Content editing. Definitely, this scenario leads to modify the didactic conception of the teaching-learning process in Higher Education.

The objective of the interview with professors was to directly obtain information about the use of these devices as an online learning scenario in the students of the Bachelor of Computer Education career, containing two

dimensions and six indicators (table 3); Regarding this instrument, according to the number of interviewees, it was classified as an informative individual interview, marked by a positive environment and willingness to offer information.

The results obtained revealed that in indicator 1.1 the mastery of communication tools by teachers is verified: two teachers (20%) were located at the high level; five teachers (50%) at the middle level and three teachers (15%) at the low level, so this indicator was relatively positive, although limitations persist in this regard. With respect to indicator 1.2, the trend revealed three teachers (15%) at the high level, five teachers (50%) at the middle level and two teachers (20%) at the low level, because despite this, mastery was denoted. of academic management tools through mobile devices.

In contrast to the above, indicator 1.3 marked a higher trend: 7 teachers (70%) reached the high level, one teacher (10%) was at the medium level and two teachers (20%) had deficiencies in terms of mastery of personal management tools. In this sense, indicator 2.1 evidenced a location of five teachers (50%) at the high level, another four (40 %) at the middle level; however, one teacher (10%) reached the low level in terms of interaction and knowledge management with mobile devices. With regard to indicator 2.2, about skills for downloading and viewing files online, the trend was completely higher, with 100% of teachers being at the high level. The result of indicator 2.3 showed that six teachers (60%) reached the highest level, four teachers (40%), although they present some deficiencies in the presentation of tasks and development of online exams, were located at the medium level and only one teacher (10%) reached the lowest level. Once the analysis of this applied instrument was completed, it was possible to conclude that the teachers taken as a sample in this article showed the greatest tendency between the

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medium and high levels; On the other hand, there are still deficiencies in the cognitive and procedural order for the use of these media as learning scenarios.

**Table 3-** Indicators to be measured in the teacher interview

		Indicators	High	Means, medium	Under
Dimension 1 cognitive	1.1	Mastery of communication tools	2	5	3
	1.2	Domain of academic management tools	3	5	2
	1.3	Domain of personal management tools	7	1	2
Dimension 2 procedural	2.1	Skills for interaction and knowledge management with mobile devices	5	4	1
	2.2	Skills for viewing and downloading files online	10	-	-
		Presentation of tasks and development of exams	6	3	1

Regarding the survey applied to teachers, in order to obtain information through direct, content, open and closed dichotomous questions, responses were obtained that reflected knowledge and intentions of teachers about the use that students make of the devices. mobiles as a learning scenario. Regarding question number one, where it was asked if they have knowledge about the use that students give to mobile devices, two teachers (20%) answered yes, five teachers (50%) answered no and three (15%) responded sometimes.

When reviewing the answers to question number two about the knowledge about the time that students spend with mobile devices, three teachers (15%) answered yes; that is to say, they argued that the students spend more than ten hours a week connected approximately to internet social networks and they expressed collaterally that the students stay with these media at all times. In turn, five teachers (50%) answered no and two teachers (20%) sometimes.

In the case of question number three, which investigates whether teachers know the different expressions pronounced by students regarding these media, seven teachers (70%) answered yes, one teacher (10%) answered no and two teachers (20%) said sometimes. In question number four, which refers to the teacher's approval for the use of mobile devices in the face-to-face class, the results were as follows: six teachers, representing 60% of the total sampled, reported being in agreement in which students used mobile devices in the educational institution; meanwhile, four (40%) teachers supported the idea of prohibiting them from bringing these devices into the classroom, considering that they could distract attention.

Taking into account what was expressed by different authors who maintain that it is necessary to reflect on the emerging pedagogical practices that require responses to the needs of training and development of learning in students, DzibMoo (2020) inquired with question number three if they considered opportune to exemplify some expressions emitted by the students regarding these novel means during the investigation process. Among the ideas they exemplified were:

- I feel bad when I don't have a mobile, tablet or laptop.
- I do not like to be disturbed when I am connected with these media.

- I go to bed late because I'm on my cell phone.
- I prefer the mobile, the tablet or the laptop to watching television, studying and hanging out with friends.

These ideas denote the value that students give to the use of mobile devices, although their excessive use in some cases may be worrying.

To the sample of teachers, the observation method was applied to the teaching of different organizational forms of the teaching-learning process, in particular the class, in subjects of the Computer Elements discipline, of the first year of the career.

The observation was carried out under the previously informed consent of the teachers who taught. Its objective was to obtain information related to the use of mobile devices as a learning scenario by teachers from the classroom. A total of five classes were observed, taking into account the following four criteria:

1. Ensuring the necessary preconditions that allow students to use mobile devices.
2. Use of the contents of the specialty in the use of mobile devices.
3. Willingness to encourage the use of mobile devices in class.
4. Skills that teachers manifest for the exchange of information in classes, based on the use of mobile devices.

Regarding the statistical processing of class observation, the results were as follows:

Ensuring the necessary preconditions for students to use mobile devices is intentional in only two classes (40%). Despite the fact that the content of the subjects favored the use of mobile devices in its entirety, only in

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two classes observed (40%) this criterion was met. Likewise, the teacher's total willingness to use these technological resources was evidenced in all the classes observed (100%), although the teachers conceived it through electronic PowerPoint presentations and Word documents on personal desktop computers. In the observed classes, it was found that the teachers presented deficiencies in terms of the practical skills necessary for the exchange of information in classes, based on the use of mobile devices.

## DISCUSSION

In the bibliographic review carried out, it was possible to appreciate that there are coincidences with different authors, whose studies precede the present investigation; among them are: Cabero & Barroso (2016), Basantes *et al.* (2017), Guerrero *et al.* (2020), who refer to the fact that virtualization is one of the substantive processes and a necessary objective of universities, that ICTs become alternatives and tools par excellence to respond to educational systems, but that teachers must evolve towards a much more dynamic and collaborative training.

It is worth noting the full agreement with these authors, since they refer to the need for the development of computerization and clarify that there can be no disadvantages or discrimination based on the possibilities offered by blended learning, an issue fully taken into account in this research, since that it is its intention, to offer possibilities for all students equally.

Ferdiguet *et al.* (2020) alludes to the fact that the modalities of digital education or teaching have gained a new impetus as a consequence of COVID-19, which has made it impossible for students and professors to be physically present at the University. Garcia -Peñalvoet *et al.* (2020) asserts that

from this event, education changed its form of management and attendance without losing its substantial formative essence.

In this same line of thought, coinciding with the present investigation, are the studies by Castro & González (2016), who agree that learning must be an active process and not a simple reception and memorization of information, where the teacher is considered a facilitator of learning, with equity and inclusion, and the student with responsibility as an entity in the knowledge society. Likewise, Acosta-Silva (2016) alludes to the fact that most students carry mobile devices with them, which does not ensure that they are skilled in their proper use, but in the author's opinion they allow the transformation of educational opportunities and their results.

Substantial contradictions with Cabero & Barroso (2016), Guerrero *et al.* (2020), who assume that the teacher has the necessary knowledge to carry out a quality online teaching process, and not only pay attention to the fulfillment of scheduled tasks, but also keep in mind the affective-emotional sphere of the student, and Pérez (2018), who states that young people are aware of technology. The exploratory study carried out showed the lack of necessary knowledge of teachers and students to develop this process with quality.

The results of this initial diagnosis allowed us to assess opportunities and risks regarding the use of mobile devices in the educational institution, which coincides with Salirrosaset *al.* (2021), who states that the new scenarios that arise in the educational context for training are close to a change in face-to-face methodology towards another that takes advantage of the potential that the Internet offers, as presented in the consulted bibliography.

As for whether teachers use mobile devices for their teaching activity: 9 (90%) use mobile phones, 2 (20%) digital tablets and

10 (100%) use laptops, all for content management and personal communication. The participation of the students in this study is valued as positive; all expressed willingness and, above all, digital skills, being students of the Bachelor's degree in Computer Education and having a good command of educational technology.

Consequently, based on the data obtained, the need for greater knowledge and adequate preparation of students and teachers was confirmed to improve educational practice, both in person and online, and to improve the teaching-learning process in online through mobile devices.

The study carried out evidenced the current didactic challenge of the need for a paradigm shift in the teaching-learning process, regarding the use of mobile devices as online learning scenarios in virtual conditions.

This article opens new paths to science, among which are projected as recommendations to continue the line of research and development of alternatives for the improvement of the teaching-learning process with the use of these means. As well as disseminating the results of research in the different spaces of scientific-educational activity.

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**Conflict of interest:**

The authors declare not to have any conflicts of interest.

**Authors' Contribution:**

The authors have participated in the writing of the work and analysis of the documents.



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