Article **Journal University Management**
June 2022, Vol.6 No.15 1-13

Digital competencies and their use in teaching activities at the higher education level

Las competencias digitales y su uso en actividades docentes en el nivel de educación superior

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DOI: 10.35429/JUM.2022.15.6.1.13 Received January 10, 2022; Accepted June 30, 2022

Abstract

The present work is an analysis of the digital competencies of higher education teachers in the northern zone of the State of Campeche in order to know the concrete actions they perform with these technologies in activities such as planning, development and communication of their classes. This is a descriptive study with a mixed approach. The design is non-experimental, correlational and cross-sectional since the information is collected at a single moment. The results show that 39.2% of the teachers use 3 to 4 devices simultaneously in spite of their economic difficulties. Regarding the use of specialized software in their area to prepare their work, 27% mentioned that they always use it. In this study, a weak correlation (.242) at a significance level of .05 was found between the effective use of search engines for online information and the fact that they have to be added to the classroom activity plan to solve problems.

Analysis, Competences, Correlational, Teachers

Resumen

El presente trabajo es un análisis de las competencias digitales de los profesores de educación superior de la zona norte del Estado de Campeche para conocer las acciones concretas que realizan con estas tecnologías en actividades como la planeación, desarrollo y comunicación de sus clases. Este estudio es de tipo descriptivo con un enfoque mixto. El diseño es no experimental, correlacional y es transversal ya que se saca la información en un solo momento. Los resultados muestran que un 39.2% de los maestros emplean de 3 a 4 dispositivos simultáneamente a pesar de sus dificultades económicas. Respecto al manejo de software especializado en su área para elaborar sus trabajos el 27% menciona que siempre lo emplea. En este estudio se encontró una correlación débil (.242) a un nivel de significancia de .05, entre el empleo de los motores de búsqueda de manera efectiva de la información en línea y el que se tenga que agregar al plan de actividades de aula para resolver problemas.

Análisis, Competencias, Correlacional, Profesores

Citation: BACAB-SANCHEZ, José R., CHI-CHAN, María Teresita de Jesús, LÓPEZ-PONCE, María Eugenia and VELAZQUEZ-CHE, Briceyra Guadalupe. Digital competencies and their use in teaching activities at the higher education level. Journal University Management. 2022. 6-15:1-13.

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Introduction

The use of digital skills represents for this time a condition for the competitiveness of a teacher. It is necessary to teach today's students what will be demanded tomorrow. Therefore, a modern teacher must keep up with and know about various modern technologies, own them, be able to apply them in practice (Serezhkina, 2021). Digital competence is key to lifelong learning In a society that has become increasingly digitized, the demand for digitally competent teachers has evolved, imposing the need for new approaches when it comes to the integration of technology in education (Instefjord and Munthe 2017).

The adoption and integration of ICT is of paramount importance to access knowledge and keep up to date with modern developments. There are global resources available such as digital libraries where teachers, students and professionals can access and share research and course materials at any time of the day and anywhere (Suárez-Rodríguez et al, 2018).

In some regions, such as Europe, they have the European Digital Competence Framework (DigComp, 2013, 2016), which proposes incorporating the digital competences necessary for citizens to fully participate in today's knowledge-based digital society (Marimon-Martí et al. 2022).

On the other hand, this maelstrom that Mexico is going through pressures it to generate changes in its teaching and learning processes and ICTs are considered in the introduction of educational systems as necessary resources for adoption (Baelo and Cantón, 2009). In this reality, ICTs become indispensable instruments in current education since they optimize the effectiveness of the educational process (Sancho et al., 2008), and allow the intervention and collaboration of people for the collective elaboration of knowledge and sources. search for quality. Therefore, they are in charge of improving, contributing, proposing and articulating procedures, methods, ways of working, organizations and artifacts that allow society to be informed faster and with better quality (Cruz et al., 2019).

In this integration process, teachers acquire singular importance in the use and application of ICT (Vera et al., 2014). The introduction of ICT in the classroom has opened new horizons to improve the quality of education and in the processes to generate new products. Of course, it has exposed the digital skills of teachers in their preparation to the test (Prendes et al., 2010). At present, the range of opportunities offered by ICT in education are wide (Salinas, 2004).

Third, a research dimension must be added, and fourth, a technological dimension that adds ethical and legal issues. For Mexico Zempoalteca et al. (2017) investigate in terms of perception, the ICT training of teachers and students in relation to digital competence and the use of ICT in Web 1.0 and 2.0 environments. They find that there is an age range of fifty-five years or more, in which they mention that there is a strong relationship between ICT training and digital skills in teachers of that range.

This work is justified by the lack of information related to the incorporation of digital skills in the Mexican southeast and because for the Campeche region it is essential to obtain a paradigm shift in the educational system that is durable and not temporary, which today it is presented as a leap in time and that it corresponds to a need in the state educational system in the training of future professionals. This hardship permeates even more in our context, since the reality of the classes is much richer in content than what is revealed in the established plans.

The objectives pursued by this research are: a).- Identify the technological tools most used by higher education teachers in the northern part of the State of Campeche to establish the relationship between the time of use and the age of the teachers. b).- Analyze the technological or digital teaching skills of higher education teachers in this area to know their use and importance in the educational activities of teachers. c).- To analyze how significant is the use of ICT in the activities of teachers to locate their relationship among themselves.

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Theoretical framework

In general, the ICT Competency Standards for Teachers project (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2011) mentions three approaches to educational change: First ICT basics, second, the deepening of knowledge and third, the generation of knowledge. The basic notions of technology consist of preparing students, citizens and workers, so that they are capable of understanding new technologies and can thus support social development and improve economic productivity. Regarding the deepening of knowledge, it consists of understanding the capacity to carry out information management. Digital competencies are the perspective of the new educational training, with a clear purpose of educating and preparing students (Manco-Chavez, et al. 2020), giving them the opportunity to appropriate new knowledge, ICT tools that serve to include them within the educational system (Lévano et al. 2019). Likewise, the proposal of Martinez-Sala and Alemany-Martinez (2022) is to optimally integrate a social network as a complementary learning tool that serves the acquisition of digital competencies.

In other words, digital competencies are the acquired capacity and knowledge of the use of technologies that allow a better disposition to articulate actions of a planning, communicative and investigative nature.

The terms related to ICT contemplate all forms of technology used to create, store, exchange and process information in its various forms, such as data, voice conversations, still or moving images, multimedia presentations (Tello, 2007). Today, the computer goes from being a sophisticated and fast calculating machine, to being an essential machine to communicate and transmit knowledge that can be given through the multimedia environment where sound, voice, text and the ability to work together at a distance they are a reality (Custodio and Suárez, 2014) and in the covid-19 period this was intensely required in the Mexican educational system.

The demand for the implementation of ICTs in vocational training is currently in force, as mentioned by Lévano et al. (2019) it is to be considered that the digital skills of the 21st century boost the competitiveness and innovation capacity of institutions.

Pedagogical competencies consist of the teacher's personality, interests, values, and ideals, professional knowledge of the subject matter taught, teaching methods, and development of communication skills, diligence, foresight, professional independence, and quick comprehension. of sensory information (Ikromova, A., 2020).

Appropriation is the way in which teachers incorporate ICT into their daily class activities (Valencia-Ramírez et al 2016). On the other hand, the adoption of ICTs is governed by the characteristics of teachers, such as age, gender, educational experience, knowledge of ICTs and attitudes towards them (Lawrence and Tar, 2018). Due to the latter, being able to integrate and use technology for educational purposes implies having a set of generic skills suitable for all situations, both personal and professional, and this is what is known as professional digital skills.

Davis (1989) formulates the Technology Acceptance Model (TAM), which suggests that the attitude towards the use of an ICT is considered in two prior variables: perceived usefulness and perceived ease of use. Perceived usefulness considers extrinsic or self-motivation of the user and is defined as "the degree to which a person believes that using a particular system would improve his or her job performance" (Davis, 1989, p.320), while perceived usefulness is perceived ease of use and is "the degree to which a person believes that using a particular system will not require effort" (Davis, 1989, p. 320).

The conceptualization that can be given to digital competencies always indicates that it is a concept that is related to the use and mastery of different technological tools, as well as the associated skills required for their correct use. (Sandí. and Sanz, 2018). Teachers should consider that education can achieve attitude changes in students (Verdú, 1998).

Method

Study type and design

This study is descriptive, with a mixed approach. The design is non-experimental, correlational and transactional (Hernández et al., 2014). The method is the field study and the technique is the survey, with the questionnaire as an instrument.

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Instrument

A questionnaire was designed that served as an instrument taking into account the ICT competency standards for teachers of the United Nations Educational, Scientific and Cultural Organization (UNESCO Institute of Statistics, 2013) and appropriated by the university. Javeriana de Cali-UNESCO in 2016. A part of socioeconomic data was considered that included 11 open questions related to the time spent using the devices, Internet access, hours dedicated to each activity, and work experience, among others.

In part 2.- What is related to the professional competences of the teacher is considered, it includes 12 questions on a Likert-type scale to determine the knowledge, use, and application of ICT.

In part 3.- What is related to the pedagogical competences of teachers is considered, here 13 questions are considered on a Lickert-type scale to determine knowledge, the use of teaching and learning strategies with the applications of ICTs in tasks and school activities.

In part 4.- What is related to the communication skills of teachers is considered, here 9 questions are considered on a Likert-type scale to determine the knowledge, use, and application of ICTs in terms of teacher communication.

Dimensions or variables	Number of items	Cronbach's Alpha
Professional skills	12	.911
Pedagogical competences	13	.927
Technological communication skills	9	.926

Table 1 Variables considered in the instrument.
Source: Own elaboration

Regarding the validity of the instrument, the theoretical framework of these ICT competency standards for teachers was taken into account and the expert technique was also used, that is, the validity was also supported by the judgment of three experts (Hernández et al., 2014)

The reliability of the instrument was obtained by applying a previous sample and subsequently obtaining the Conbrach's Alpha, having a result greater than 0.90 (Table 1).

Study participants

The participants were higher education teachers from the northern zone of the State of Campeche, Mexico, which includes the municipalities of Tenabo, Hecelchakán and Calkiní. From a total of 211 professors who work in higher education schools in the study area, a random sample of 74 professors was obtained, of which 41 were men and 33 women, considering 95% reliability and 5% reliability. maximum permissible error.

School	Total teachers	Teachers participating in the sample
school 1	105	27
school 2	16	8
school 3	14	6
school 4	32	11
school 5	23	8
school 6	21	14
Total	211	74

Table 2 Teachers participating in the study
Source: Own elaboration

The selection of the participants was done randomly, that is, depending on whether they were in their educational institution at the time of the application of the instrument, they were asked if they supported us by answering a questionnaire, those who accepted continued with the application and those who answered no, were told that it was all. It is worth mentioning that the surveys were conducted three months before the beginning of the pandemic at the end of 2019. The results obtained correspond to the study area contemplated in this work.

Results and discussion

In relation to the analysis of the identification of technological tools used by teachers

Some of them are shown below: The most used are laptops and cell phones with 27%, teachers who only use laptops were 21%, and are followed by those who use desktop computers, laptops, tablets and cell phones at the same time with 16.2%. In other words we can mention that 100% of teachers handle at least one device.

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But 39.2% use 3 to 4 devices, which is understandable because they are interacting with the technological innovations that are more accessible. This is important since the pressure to use these devices was very marked on the one hand and on the other the socioeconomic conditions of the teachers are not the best, since a good part of them have a salary between 8,000 to 12,000 pesos per month.

In the studies of Vera et al. (2014) they find something similar to this study since the factor of the frequency with which the computer is used, results in 55% of teachers who use it, equivalent to the use of 5 times or more per week. Regarding the factor of adoption of technology based on interests (adoption in ranges), these same authors comment that 39% of teachers perceive themselves at the refined level, 33% at the advanced level and 28% at the basic level.

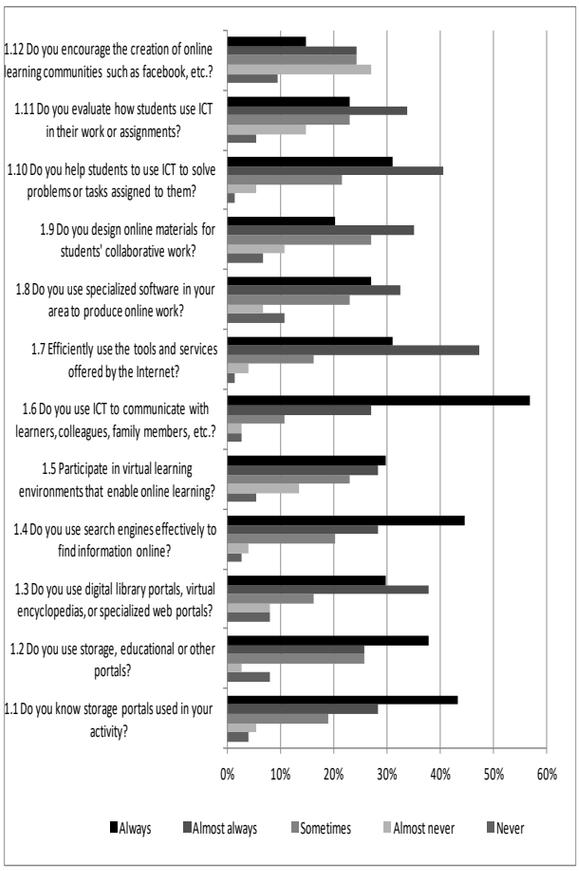
In relation to the analysis of professional competences

43% mentioned that they always have knowledge of the storage portals to develop their activities, 28% commented that they almost always have the knowledge, 18% allude that sometimes. On the other hand, 37% say that they always use storage portals (Graphic 1).

Consistent with the design of online materials for collaborative work with students, 35% of teachers responded that they almost always do it, followed by 27% who mention that sometimes, and 16% who say that they almost never and never design online materials for collaborative student work. This is important to consider since to the extent that the teacher encourages the use of the Internet to view their materials or activities, students accept these tools as part of their daily actions.

56% of teachers always use ICT to communicate with students, colleagues and family members, 27% mention that almost always. In other words, it is in the communication elements where technological skills predominate more markedly.

Díaz (2017) concludes something similar by stating that it is necessary to improve the computer skills of teachers so that they can guide students in the use of ICT for learning, through the development of digital skills. In the work of George and Salado (2022), it is reported that the assessment about the manipulation of digital content was positive, the response was in agreement and very close to totally agree, which reflects that teachers perceive themselves themselves as efficient users of digital content.



Graphic 1 Percentage of the perception of professional competencies in teachers
Source: Own elaboration

Regarding the analysis of pedagogical competencies

45% of the teachers almost always identify the problems that exist in their teaching practice and the opportunity that ICTs offer to solve them. On the other hand, 40% of them mention that they sometimes participate with their colleagues in discussions about the benefits of ICT for the planning of their activities. In other words, it is recognized that ICT can help to improve work activities, but less than half of them are interested in talking about the opportunity they have in front of them in reference to ICT (Graph 2).

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In another sense, 29% of the teachers surveyed mention that they always implement strategies for the use of ICT in the teaching and learning process according to each of their educational programs, 35% mentioned that they almost always implement these strategies. However, for the development of content that requires ICT to be carried out in their institution, 20% mentioned that they always do it, but 8% mention that they have never done it. In other words, it is one thing to think about the strategy and another is to generate activities that allow the development of said strategies. As we can see, there is a percentage of professors who are not using ICT as it should be and being able to contribute something to their institution that renews the way they see the teaching process.

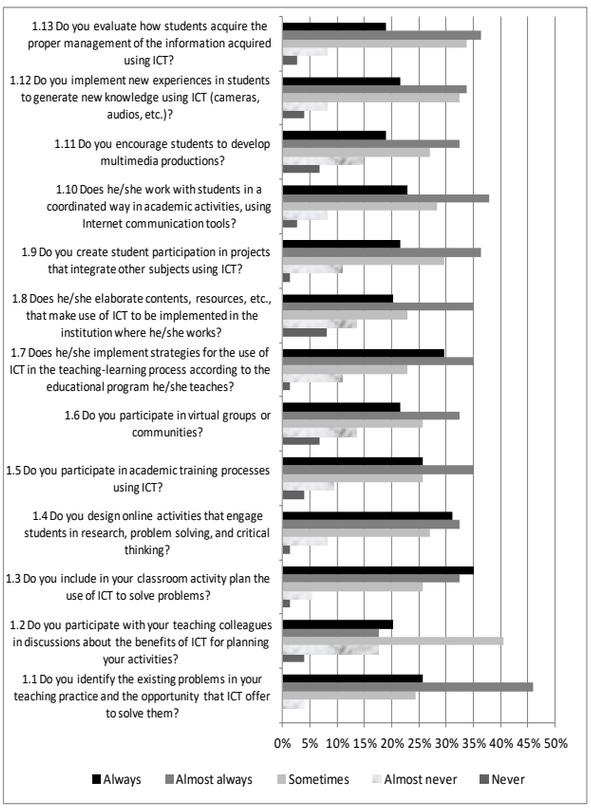
On the other hand, 20% of teachers report that they always implement new experiences in students to generate new knowledge in their activities using cameras, audio, etc. These results are good from the point of view of the use of information technologies because at least there is a process of integration of ICT in the processes of the teachers and in the activities directed to the students.

In the work of Sa'ari et al. (2005), it was noted that teachers strongly agreed with 18.1% and agreed with 55% that they enjoyed using new tools for instruction. They also believed that computers are valuable tools that can be used to improve the quality of education with 55.6%. 56.9% of teachers agreed that they need more time to learn to use computers and more time to change the curriculum to incorporate improvements over technology at 60.6%.

On the other hand, teachers seem to express a number of concerns about computer application in the classroom, such as the lack of adequate training in aspects of technology and techniques in the use of Information Technology. They agreed that they need more training with technology, as 69.4% comment on that, They also require more training for curriculum and didactic strategies that can integrate technology.

There has been a relative advance in the use and implementation of ICT in the Teaching and Learning processes on the teachers' side and an improvement in relation to previous years. In comparison with the work of Sa'ari et al. (2005) in which the concern was in a higher percentage to apply computers in the classroom, in this study the application is taking place although not in its totality, there is a lack of improvement in such application since all that is available today in terms of ICT resources is being wasted, despite the fact that there is more online use for activities with students.

In the work of Torres-Florez, Rincón-Ramírez and Medina-Moreno (2022) it is concluded that the level of appropriation of digital competencies was of a medium-high level, this in reference to those associated with the knowledge and use of cloud storage platforms, collection of digital information from the internet for academic activities, knowledge of online tools for searching and storing information and making backup copies of documents on different devices. Therefore, it is important to implement new measures in the institutional environment to strengthen digital competencies.



Graphic 2 Percentage of the perception of pedagogical competences in teachers
Source: Own elaboration

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Regarding the analysis of the technological competences of teaching communication

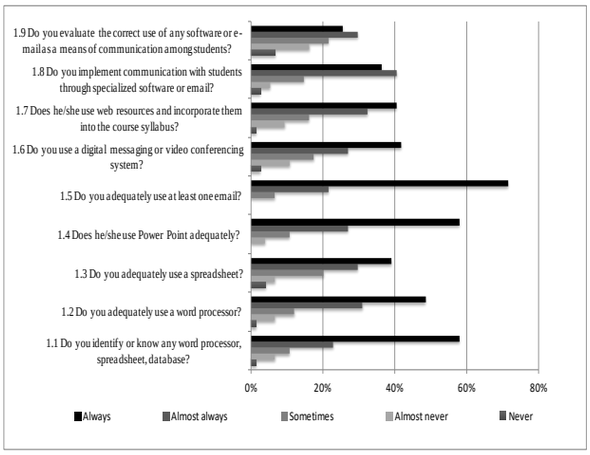
In relation to aspects of teacher communication, the following is presented: 58.1% of teachers mention that they can always identify or know a word processor, spreadsheet or database. If it can be identified, it can be used, in This path is the use of the processor, spreadsheet or database since 48.6% indicate that they always use the word processor properly, 31.1% insinuate that they almost always. Likewise, it is also found that 39.2% denote that they always use a spreadsheet properly (Graphic 3).

In the studies by Vera et al. (2014) find something similar. According to the results, the word processor is being used by 60% of the teachers with a frequency of more than five times a week. This result also coincides with that found in the work of Sa'ari et al. (2005), which reveal that the participants with the highest level of skills were competent in word processing with 42.5%, followed by basic computer skills with 39.4%, spreadsheets with 14.4% and telecommunications with 13.8%. %, but had the lowest level of media communication skills with 7.5%.

In this study more than half responded that they recognize word processors and handle them adequately, that is, there is a coincidence with the result obtained in Sa'ari et al. (2005), but here in comparison with these researchers there is an improvement in the handling of media communication, which is understandable due to the progress that has been made in this area with the creation of electric mail and the invention of other forms of communication such as video-calls in the last decade.

On the other hand, 41% comment that they always use web resources and incorporate them into their subject plan, 32% list that almost always, 16% denote that sometimes (Table 4). The use of information available on the Internet among teachers is widespread. This result coincides with that found by Zare-ee (2011) where it is mentioned that all teachers reported having obtained or developed ICT-based materials for teaching and research. Escorcia-Oyola and Jaimes de Triviño (2015) also find that the greatest use of ICT presented in significant classroom projects refers to the media for communication.

Corresponds to the use of word processors, spreadsheets, presentation software, diagramming and web page design. On the other hand:



Graphic 3 Percentage of the perception of technological competences in teaching communication.
Source: Own elaboration

In relation to the technological competences and the age of the teachers

In reference to the reflection by age of the teachers surveyed, 48.6% present themselves in an age range between 33 and 41 years. They are followed with 29.7% by those between 42 and 50 years of age. Another 10.8% are between the range of 24 and 32 years of age. This indicates that 89.1% of teachers are between the ages of 24 and 50, that is, we have 2 generations of teachers teaching classes at the higher level (Hernández, 2021), the first are a generation that is characterized by registering a intensive profile in the access and use of ICT and the latter those who have shown to adapt easily to technological changes. However, we can also note that there is a 10.9% who are in an age range of 51 years and older, Although they use technology, they present a lower level of interaction compared to other age groups. This generation was prior to the global and digital era, but they are adapting to the use and application of all the tools and resources offered by ICTs.

However, this last generation, the older one, shows more equal adaptability traits regarding the mastery of the dimensions studied in this work, something that was expected due to the exposure to so many digital resources (Graph 4), since they present a more homogeneous valuation behavior, that is, 28% mention that they almost always make use of ICT in the three dimensions studied.

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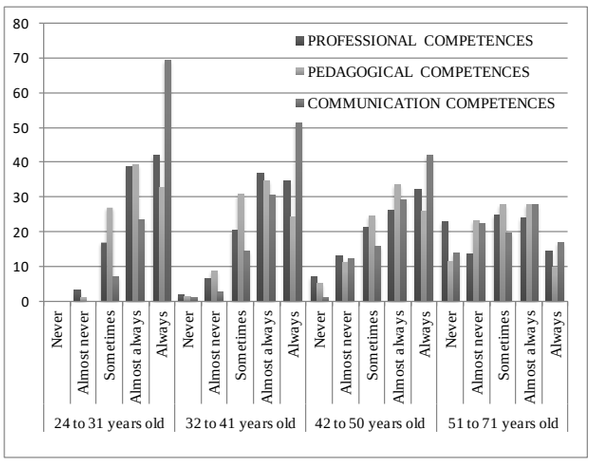
Also, older teachers progress more slowly but more evenly, that is, they show concern for learning and mastering ICTs in the dimensions of technological competencies, pedagogical competencies and communication competencies.



Graphic 4 Age of teachers and ICT skills
Source: Own elaboration

As Pérez (2005) mentions, a good part of this knowledge society remains connected to a screen and in that connection they weave their social relationships. On the training and preparation of new teachers Prendes et al. (2010) They find that students who are preparing to be teachers have different skills in the knowledge and connection of different computer equipment, they also have the skills to solve different problems through the use of the Internet.

We see that, as Rosario and Vásquez (2012) found, they dominate search resources, wiki pages, email, but neglect the more specialized search that can lead to better professional preparation, but it is understood that digital competence involves a learning process. complex, gradual and recurring, which encompasses the ability to adequately use digital tools and resources (Pozos and Fernández, 2018; Peñalva-Vélez et al 2018)

Regarding the analysis of how significant are ICTs at the higher level

By considering the qualitative variables and establishing them on a scale, the association of the assessment of perception with each of the dimensions considered in the study was determined. A Kendall's Tau b correlation of .949 was obtained with a significance level of less than .05, for technological or digital skills and the assessment levels of the scale.

That is, there is an association between this dimension and the established scale. Regarding the pedagogical competences, a correlation of .60 is presented with a significance level of .14, the technological competence of teaching communication had a correlation of 1 at a significance level of less than .05.

Subsequently, the level of association of two variables was measured to quantify the relational importance that, for example, an item from the technological dimension presents with another from the dimension of pedagogical competence or teaching and learning. This in order to determine how much efficient use of Internet searches occurs with the transfer to the teacher's activities in classroom activities.

We then seek to determine how the following action, Do you use search engines effectively to find information online? (V1), presents a degree of association with the following fact, Do you add the use of ICT to solve problems in your classroom activity plan? (V2). For this, Spearman's Rho correlation coefficient is calculated. A correlation of .24 was found at a significance level of less than .05, that is, the null hypothesis that there is no association is rejected and the alternative hypothesis that there is an association between the variables is accepted. In other words, We can mention that there is a relatively low association when using search engines effectively to find information with the fact of adding the use of ICT to solve problems in the classroom activity plan. In other words, the fact that teachers use search engines efficiently guarantees little that the use of ICTs be added to the classroom activity plan, since there is a weak association between these two situations (Table 3).

The following combination is elaborated: Do you add in your classroom activity plan the use of ICT to solve problems (V2), and it is compared to see if it presents a degree of association with the following fact, Do you participate with your teaching colleagues in debates about the benefits of ICT for the planning of your activities (V3). When we compare whether there is a relationship between the fact of adding the use of ICT to the classroom activity plan and the participation of teachers with their colleagues in discussions about the benefits of ICT for planning their activities, the results are encouraging.

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The correlation is .46 at a significance level of .05. That is, discussing and talking with other teachers about the importance of ICT for their activities is beneficial and is associated with adding the use of ICT to solve problems in their classroom activity plans. This is relevant when by talking with other teachers there is a process of innovation to use ICT and consider them in the activities developed.

Variable	Variable	Spearman's Rho correlation	Next (Bilateral)
Do you use search engines effectively to find information online? (v1)	Do you include the use of ICT to solve problems in your classroom activity plan? (v2)	.242	.037
	Do you participate with your fellow teachers in discussions about the benefits of ICT for planning your activities? (V3)	.163	.167
Do you include the use of ICT to solve problems in your classroom activity plan? (v2)	Do you participate with your fellow teachers in discussions about the benefits of ICT for planning your activities? (V3)	.469	.000

Table 3 Correlation of the use of search engines effectively
Source: Own elaboration

When contrasting age with the variable, use the tools and services offered by the Internet efficiently (Table 4), there is a correlation (-.273) at a significance level of .05, that is, there is an association in the direction On the contrary, the more you get older, the efficient use of the tools offered by the Internet decreases, similar to what was found by Marimon-Martí et al (2022).

Variable	Variable	Spearman's Rho correlation	Next (Bilateral)
Age	Do you use search engines effectively to find information online?	-.275	.018
	Do you use the tools and services offered by the Internet efficiently?	-.273	.018
	Do you design online activities that engage students in doing research, solving problems, being critical?	-.208	.076

Table 4 Correlation of age and some variables of interest
Source: Own elaboration

Conclusions

This work reveals that 100% of teachers handle at least one device and 39.2% of them use 3 to 4 devices, but this does not guarantee efficient use of computer packages and services available on the Internet to improve activity. teacher. There is a relationship between the time of use of the devices to do activities related to teaching with the time of use of the computer or laptop. As Demeshkant (2020) concludes, apart from technical teaching skills related to the use of various devices such as interactive whiteboards, laptops or tablets, it is immensely important to increase teachers' awareness of the purpose of applying technology in The education.

Among the factors that are intertwined to assimilate ICT in the actions of teachers are institutions, resources and the teacher, (Lizárraga et al, 2020; Tapasco and Giraldo, 2017; Mumtaz, 2000; Umoru, 2012). Despite the fact that the survey phase was carried out before the pandemic, recent studies such as that of Serezhkina (2021) in Russia find that there is still a process of integration and appropriation among teachers of digital skills. In Greece, as reported by Perifanou et al (2021), in times of pandemic, around two thirds of teachers used digital tools extensively to find, evaluate and develop educational resources, as well as to teach.

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Egúsquiza (2022) finds in Peru that although teachers acquire digital competence by training in the use of augmented reality, it is not capitalized in the application of learning activities, thus deriving more as recreational or destructive activities than for learning achievement purposes.

Regarding the management of specialized software in their area to prepare their work, 27% mention that they always use it. That is, there is a lack of better performance in the preparation and management of computer tools that lead to a better specialization in the professional training of young students in the State of Campeche.

Teachers almost always use the resources offered by ICT such as search engines, storage portals, digital libraries, virtual encyclopedias, specialized websites, as well as learning communities through Facebook or another, that is, , have a greater source of educational resources that allow efficiency in the work of teaching communication.

29% of teachers mention that they always implement strategies for the use of ICT in the teaching and learning process according to each of their educational programs, 35% mentioned that they almost always do so. However, for the preparation of content that requires ICT to be carried out in their institution, 20% mentioned that they always do it, but 8% mention that they have never done it and 13% express that they almost never do it. There is a group of teachers who have not incorporated actions in which students have direct contact with ICT as part of the fact or task. There is not an even distribution in all teachers in the ICT domain that facilitates its implementation in school activities.

In the teachers, 18% of them mention that they always promote in the students the elaboration of some multimedia production, there is an opportunity to improve in the design of the activities and consider the multimedia works within the portfolio of activities that the teachers could consider.

There is a significant positive relationship between adding the use of ICT to solve problems in their classroom activity plan and the debate that takes place among teachers about the benefits of ICT to plan their activities. This is an important result since the dialogue between the teacher colleagues helps disperse that the use of ICT is considered among their classroom activities.

It is not easy to integrate technology into classroom practices, but this is one of the challenges facing teachers in the 21st century. As Afshari et al. (2009), Effectively integrating ICT into learning systems is much more complicated than providing computers and ensuring an Internet connection. Technology integration takes time; time to learn these technologies, time to be adequately prepared to use it. For their part, Cabero-Almenara, et al (2020) find that the most valued areas have been Digital Pedagogy and Digital Resources.

But the best way to initiate the use of ICT is in a combined or mixed way, in which teachers participate themselves in the online update (Mirke, E., Cakula, S., Tzivian, L. 2019), learning from their own experience when participating in such training (Dabner et al., 2012). Because not only the future professionals coming out of the schools are favored but also the companies and the industry since through a better professional preparation, these would have a better efficiency and productivity, guaranteeing a better interaction in the markets.

Thanks

To the Calkini Higher Technological Institute in the State of Campeche for the facilities provided to carry out this project.

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