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*Artículos científicos*

## **Implementación socioafectiva de herramientas virtuales en el quehacer tutorial. Una visión desde el docente tutor**

***Socio-affective implementation of virtual tools in the tutorial work. A vision from the tutor teacher***

***Implementação socioafetiva de ferramentas virtuais em trabalhos tutoriais. Uma visão do professor tutor***

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### **Resumen**

La función del docente tutor todavía es uno de los retos por mejorar para apoyar a los estudiantes, en especial cuando se considera el contexto actual en el que están inmersos los adolescentes. Por ello, el presente trabajo tuvo como objetivo analizar la viabilidad de implementación de los recursos académicos, virtuales, sociales y afectivos involucrados en el proceso de enseñanza y aprendizaje en el aula como apoyo al trabajo del docente tutor en el Programa Institucional de Tutorías de Nivel Medio Superior (NMS) del Instituto Politécnico Nacional (IPN). Para ello, se implementó la virtualidad combinada con el trabajo presencial,



pues se diseñaron recursos en línea puestos a disposición de los tutores en una red local, los cuales se diseñaron con el *software* libre XAMPP con la finalidad de instalar en un espacio virtual varias herramientas. La experiencia se realizó con cinco docentes tutores de NMS del Centro de Estudios Científico y Tecnológico nro. 8 del IPN. En concreto, se indagaron sus experiencias y necesidades en el entorno de e-tutorías y se verificó si los apoyos implementados contribuyeron al quehacer tutorial desde la visión y misión del docente tutor. En tal sentido, se halló una gran aceptación de los recursos y los participantes hicieron propuestas de secciones dentro del espacio virtual. Además, señalaron ventajas de este apoyo complementario, mediante el cual pudieron resolver el caso de un adolescente ficticio a través de los recursos disponibles en línea. La metodología fue de corte cualitativo e interpretativo, pues se analizaron las ventajas o desventajas que resultaron de la utilización de recursos de la tutoría en línea. Los hallazgos identificados permitieron detectar la facilidad y factibilidad de la organización y sistematización de los recursos para optimizar el proceso de tutorías.

**Palabras clave:** tutoría, docente tutor, e-tutorías, programa institucional de tutorías.

## Abstract

The role of the Teacher Tutor is still one of the challenges to improve to support students, even more so when we consider the current context in which adolescents are immersed. For this reason, the objective of this work was to analyze the feasibility of implementing the academic, virtual, social and affective resources involved in the teaching-learning process in the classroom, as support for the work of the Tutor Teacher in the Institutional Tutoring Program. Higher Secondary Level (NMS) of the National Polytechnic Institute (IPN), considering the relevance to the current moment, virtuality added to face-to-face work was implemented. For which online resources were designed, made available to tutors in a local network, designed and supported with the free software XAMPP, in order to install several tools in a virtual space. The experience was carried out with five NMS Teacher Tutors from the Center for Scientific and Technological Studies No. 8 of the IPN, their experiences and needs in the e-tutoring environment were investigated, it was verified if the implemented supports contributed to the tutorial task from the vision and mission of the Teacher Tutor, finding great acceptance of the resources, the participants made proposals for sections within the virtual space, pointed out advantages of this complementary support in such a way that they managed to solve the case of a fictitious adolescent through the resources available to them online. The methodology was qualitative-interpretative, allowing to analyze the advantages or disadvantages that resulted from the use of online tutoring resources. The identified findings allowed to detect the ease and

feasibility of the organization and systematization of the resources to optimize the tutoring process.

**Keywords:** tutoring, tutor teacher, e-tutorials, institutional tutoring program

## Resumo

A atuação do professor tutor ainda é um dos desafios que precisa ser aprimorado para apoiar os alunos, principalmente quando se considera o contexto atual em que os adolescentes estão imersos. Portanto, o objetivo deste trabalho foi analisar a viabilidade de implementação dos recursos acadêmicos, virtuais, sociais e afetivos envolvidos no processo de ensino e aprendizagem em sala de aula como apoio ao trabalho do professor tutor no Programa de Tutoria de Nível Institucional. Escola Secundária (NMS) do Instituto Politécnico Nacional (IPN). Para isso, foi implementada a virtualidade aliada ao trabalho presencial, uma vez que foram desenhados e disponibilizados aos tutores em rede local recursos online, os quais foram desenhados com o software livre XAMPP com a finalidade de instalar diversas ferramentas em um espaço virtual. . A experiência foi realizada com cinco professores tutores do NMS do Centro de Estudos Científicos e Tecnológicos n°. 8° do IPN. Especificamente, foram investigadas suas experiências e necessidades no ambiente de e-tutoria e verificado se os suportes implementados contribuíram para o trabalho tutorial a partir da visão e missão do professor tutor. Nesse sentido, constatou-se uma grande aceitação dos recursos e os participantes fizeram propostas de seções dentro do espaço virtual. Além disso, notaram vantagens deste apoio complementar, através do qual conseguiram resolver o caso de um adolescente fictício através dos recursos disponíveis online. A metodologia foi qualitativa e interpretativa, uma vez que foram analisadas as vantagens ou desvantagens que resultaram da utilização de recursos de tutoria online. Os achados identificados permitiram detectar a facilidade e viabilidade de organização e sistematização de recursos para otimizar o processo de tutoria.

**Palavras-chave:** tutoria, professor tutor, e-tutoria, programa de tutoria institucional.

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## Introduction

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has pointed out the prevailing need for tutoring to address the most acute problems that affect academic performance at different educational levels (Delors et al., 1996). In Mexico, tutoring emerged as a proposal from the National Association of Universities and Higher Education Institutions (ANUIES, 2014) to respond to the needs of the current situation of higher and secondary education in issues such as dropout, lag and the low level of achievement, which can be reduced through monitoring and accompaniment, both group and individual, of students throughout their academic career (ANUIES, 2014).

There are various authors who have carried out research aimed at tutoring, a topic that has grown in its implementation in schools and universities around the world. However, as Duse indicates *et al.* (2017) and Moreno *et al.* (2019), aspects such as the procedures to identify the problems that arise in each student and the reason for their problems have been left aside, which forces reflection on the orientation and promotion of the cognitive and affective aspects of learning.

Gairin *et al.* (2004) and Narro and Arredondo (2013) They propose integrating the tutorial action during the teaching work with the purpose of providing feedback to the students so that they identify their areas of opportunity. This requires, of course, guidance, motivation and support strategies to recognize their achievements and detect problems, even those that are generated outside the educational establishment (Angulo, 2021).

Fitz-Gibbon (1996, cited by Harrison, 1996) carried out a survey among the tutees to identify the main obstacles in tutoring, among which the lack of basic knowledge on the part of the tutor to guide the research project of the tutor stands out. student, as well as low interest, limited availability, inadequate supervision and lack of feedback.

In a study conducted by Campbell and Campbell (2000) to understand participants' perceived benefits of tutoring, tutees cited guidance, relevant information, academic assistance, and support with personal problems as top achievements. On the other hand, the tutors highlighted the benefits of interacting personally with the students, which allowed them to share experiences and learn from them (Díaz, 2020).

According to Martínez *et al.* (2014), tutoring is considered an educational innovation that plays a fundamental role in the comprehensive training of students. This includes the planning, delivery, tutoring and evaluation of the training actions by the tutors. Furthermore, tutoring provides skills that respond to the needs of students (Kara and Gülfidan, 2019; Waltz, 2019). However, in face-to-face education, the success of this program depends largely on the commitment and disposition of the teacher towards their students. On the other hand, in the

virtual education environment, not only these attributes are required, but also the ability to provide support, mastery of online activities and a constant presence of the teacher in the assigned spaces in order to encourage continuous communication.

López-Gómez (2017) introduced the Google Groups tool as a complement and support for virtual tutoring. Their research revealed a significant difference in the overall grades of students who received support through online tutoring. For their part, Giner *et al.* (2013) noted that, in general, teachers often enter teaching without specific training in pedagogy and psychology, which they acquire as they gain experience in teaching.

Therefore, tutoring is carried out based on the experience, confidence, pedagogical vision and perception of the teacher as a tutor. The implementation of tutoring programs in institutions has modified teaching practice and has focused attention on the needs of students (De la Cruz, 2017).

Currently, the importance of artificial intelligence in education has become a key research topic, with a focus on the development of more personalized educational systems, known as intelligent tutoring systems (Bernard *et al.*, 2020; Cao *et al.*, 2022; Kadhim and Hassan, 2020). These are used in a variety of educational fields and have proven to be especially effective with university students, as they have improved educational outcomes, motivated students to continue their development, and provided a reliable source of information (Alrakhawi *et al.*, 2023).

Although tutoring is offered in various modalities, the in-person modality is the most traditional, which involves face-to-face interaction between the tutor and the tutee. However, currently the virtual modality or e-tutoring, originally designed for virtual learning environments, which uses blended learning, is beginning to gain popularity (*learning*).

In many cases, students who choose online education come from conventional education systems, so the transition from in-person to virtual or distance education can generate challenges and concerns. Therefore, virtual tutoring plays a crucial role in the development and consolidation of distance education. Learning spaces, both virtual and in-person, enrich the student's comprehensive training. The tutor acts as a guide who shares the concerns and interests of the tutor, in addition to giving meaning to the knowledge acquired (García-Valcárcel, 2008; García *et al.*, 2012). In the case of a complementary education model, virtual tutoring can offer additional support that allows for more complete and effective work with tutees.

A crucial aspect of virtual education that must be considered when incorporating this modality into conventional tutoring is that, although students who opt for online education are learners in training, they do not always have the necessary skills to face the challenges that this modality presents. it implies. It is also important to recognize the possible sense of loneliness

and lack of interest that students may experience toward themselves as learners. Furthermore, concerns about privacy should not be overlooked (Sánchez *et al.*, 2016).

Now, electronic tutoring (known as traditional e-tutoring of *e-learning* environments) differs from traditional tutoring and demands skills adapted to the digital era, which implies the need to establish new criteria for incorporation and evaluation. continuation of the tutors. This is essential to ensure effective learning in a virtual environment, as students are increasingly oriented towards digital approaches and have free access to a wide amount of information. This reality challenges the traditional role of the teacher or tutor, so they must acquire digital skills to remain competent (Talwar *et al.*, 2015).

In addition to the above, it is essential to highlight that in virtual education there is a socio-affective aspect that should not be overlooked. As Rodríguez Rodríguez indicates *et al.* (2021), “the student and teacher experience a sense of separation that is caused by more factors than simple physical distance” (p. 59), which is reflected in psychological gaps, motivational challenges, need for autonomy and lack of a continuous dialogue. Therefore, it is vital that teachers acquire skills related to socio-affective methodologies to mitigate this distancing inherent to virtual education.

Furthermore, in the virtual and remote context, technologies present their own challenges. In a study conducted in Taiwan, Tran *et al.* (2023) highlight that the perceptions of both students and teachers in distance learning environments are fundamental. These perceptions, which may initially be positive, are negatively influenced by technological factors such as equipment stability, availability of technical support, ease of use, supportive cultural practices and even technical problems such as sound or image outages. frozen. All of these aspects can negatively impact the perceptions of those involved in the online learning process.

Taking into account all of the above, the National Polytechnic Institute, through the Academic Support Secretariat, has formalized the Institutional Tutoring Program (PIT), which focuses on meeting educational objectives both at the student and institutional level at the level. upper secondary (NMS), higher level (NS) and postgraduate. Its main objective is to provide students with the academic support, resources and stimuli necessary for their comprehensive training, through personalized attention throughout their educational career. Furthermore, it seeks to revitalize teaching practice (National Polytechnic Institute, 2007).

The PIT is applied in various educational modalities, including schooled, non-schooled and mixed. It offers a systematized organization that monitors the actions of each educational institution, recognizing the diversity of approaches. However, despite its significant achievements, the program faces certain limitations that include the lack of updating of the tutorial action in response to the new technological communication contexts, the little

compatibility in the activity schedules of the students and teachers, the low participation in some academic units and apathy to join the program, among others.

In this context, tutoring plays a crucial role in comprehensively strengthening the training of NMS students. It is also essential to provide tutor teachers with the necessary tools and content to carry out their tutorial work in virtual environments.

Therefore, this work is based on an analysis of the thesis entitled *Resources of e-tutoring and its contribution to the PIT activity in tutor teachers of the CECyT 8 Narciso Bassols*. From this analysis a proposal arises from the PIT program to strengthen the role of the Tutor Teacher. All this leads us to pose the following research question: what are the implications of academic, virtual, social and affective resources from the perspective of the teacher-tutor in their implementation selected, designed and organized in a local network space as support? in the virtual tutoring of the Institutional Tutoring Program at the upper secondary level at the Center for Scientific and Technological Studies of the National Polytechnic Institute?

In order to answer this question, the following general objective is established: analyze the implications of academic, virtual, social and affective resources from the perspective of the teacher tutor about the resources selected, designed and organized in a local network space. as support in the virtual tutoring of the Institutional Tutoring Program at the upper secondary level at the Center for Scientific and Technological Studies no. 8 of the National Polytechnic Institute.

### **Theoretical elements**

Tutoring is based on a series of theories and paradigms of psychopedagogy, with two main perspectives: constructivism and sociocultural, which are rooted in the ideas of Piaget and Vygotsky, respectively. In this research, however, we will focus exclusively on sociocultural theory, which recognizes that the understanding of the mind and consciousness is strongly influenced by the social context. In other words, an individual's psychic development is based on his or her social interactions, centered on collective activities and communication (Mutekwe, 2008). Precisely, this process is the starting point of tutoring, where we seek to get closer to the tutor to understand their individual circumstances and their environment.

According to Derry (2013), Vygotsky's perspective on rationality and epistemology in education focuses on a social process, where knowledge emerges from interactions generated and organized by those who participate and socialize (Coll, 2010). Here, learning focuses on the student, who acquires knowledge when participating in technologically advanced educational environments. This allows you to build your understanding of the world around you through the interpretation of the objects used and reflection on them. According to Bruner (1990), since the student is immersed in a culture, the meaning of learning experiences lies in

the mind of the individual and its meaning is rooted in the culture in which he or she was educated.

In recent years, various research has been carried out on cultural aspects related to learning and teaching styles in virtual environments. The results highlight the impact of students' culture on their perception of the teaching and learning process (Krish *et al.*, 2012). This approach highlights a cultural transformation that teachers experience in the information age. This change is drastic, as it incorporates digital and global dimensions into its training and practice. This includes a deep understanding of the tutees and their culture, a global perspective of education and digital skills to appropriately choose the environment and the tools used (Sánchez *et al.*, 2016), without ignoring the transnational dimension in teacher training. which implies access to international virtual networks and participation in digitalization processes, which contributes to the acquisition of new shared knowledge.

Consequently, the relationships established to build understanding arise from knowledge as they give meaning to the objects used and, of course, to the world around them. For this reason, Bruner (1990) points out that educating is based on providing the student with tools to make sense of and construct reality. This activity assumes the existence of a subcommunity in which the teacher and the student are involved through a substitute agent such as the book, the computer and virtual networks.

On the other hand, scaffolding is a series of supports that are provided to the student to help them learn, which are gradually discarded as they are able to face problems or situations without the initial help received (De la Cruz, 2017). The tutor teacher, in the tutoring scheme, plays the role of an expert person with enriched knowledge to guide the tutee towards adaptation. In this way, he manages to build understanding of the world around him through dialogue, that is, to build a bridge to achieve the objectives, which little by little becomes less necessary due to the acquired autonomy (Chi *et al.*, 2001).

According to Medina (2007), Vygotsky points out that the purpose of education is to introduce human beings to the pre-existing culture of thought and language. Furthermore, it mentions that almost all learning is managed through the mediation of people with superior knowledge, a position that cements fundamental aspects in tutoring, such as the zone of real development (ZDR) to detect and know the student's starting point and particularly the zone of proximal development (ZPD), which is defined as the distance between the actual level of development determined by the ability to independently solve a problem, and the level of potential development through problem solving under the guidance of a teacher or another more capable companion (Béjar, 2018; Guzmán, 2011). In other words, it is a phenomenon that arises when two or more people at different levels of experience carry out some activity in common. In this way, the zones of proximal development are generated through the dynamic



interaction of teaching and learning, particularly in the tutoring process by establishing the link between the tutor and the student, the foundation of which allows understanding the world around them to establish relationships in the generation of knowledge and support in the personalized tutorial process.

According to Karcher (2005), the didactic strategies used by the teacher in the tutorial process focus on the management of contingencies, modeling, instruction and triggering questions, etc., with the aim of reinforcing the cognitive processes of the tutor in the appropriation of knowledge. In this regard, De la Cruz and Abreu (2008) consider it impossible to conceive the process of knowledge generation in an abstract way, given that it is a priority for students to face the situations they experience in their daily lives, according to their ages, environments, etc. Thus, the challenges posed are discussed and analyzed with the help of an expert, whose work includes everything from searching for information to critically analyzing it. In this way, students advance from a zone of actual development to the zone of proximal development.

In the scaffolding process implemented by De la Cruz and Abreu (2008), a series of phases are mentioned that have been adjusted in order to link them to the tutoring:

a) Initial phase: The student is totally dependent on the instructions provided by the tutor teacher. Here, the tutor must give all his effort and have interest to achieve significant progress;

b) Transition phase: The need for support from the tutor is reduced, but he must still be very close to support him in the execution of his tasks. It is evident that they already have a greater capacity for action directly linked to their learning, but there are still some actions that the tutor teacher must carry out.

c) Self-regulation phase: The tutor has achieved the ability to establish instructional environments. At this time the tutor presents situations designed with the purpose of putting into practice what has been learned. He is even capable of innovating and already shows in all his splendor his skills in solving the problems he presents in his daily life. During the self-regulation phase, the student is more selective, and can identify when he or she requires help, so he is able to seek advice from his peers.

Sociocultural theory distinguishes the student-tutee as the one responsible for generating their own knowledge. Therefore, it is he himself who, throughout the tutorial process, will generate his rules and apply them to his mental model to gradually begin (with the support of his teacher tutor) the learning that allows him to be autonomous and subsequently self-manage in the resolution. from problems.

## Methodology

This work explains the selection of various support resources for the work of the tutor teacher in the PIT. To do this, the different tools offered by e-tutoring in various virtual environments were explored. The methodology used was qualitative and interpretive in nature, since through a case study it allows us to approach a real situation and obtain current, relevant and pertinent information. To collect information prior to the case study, a diagnostic questionnaire was applied on the tools that the tutor teacher had. Likewise, the academic, virtual, social and affective implications in the implementation of virtual tools in the tutorial work were examined from the perspective of the tutor teachers.

The methodology allowed us to analyze the experience of tutor teachers in an e-tutoring environment with the aim of contributing to the understanding of the situation from a descriptive approach. E-tutoring is considered part of the communication environments that offer resources to be organized in the improvement and resolution of problems that affect student learning; Therefore, virtual tutoring can be complemented with in-person tutoring.

The experience was carried out at the Center for Scientific and Technological Studies 8 (CECyT 8) of the IPN, Mexico. Five teachers selected for their knowledge of tutorial work (at least 6 years) participated; Likewise, their level of education, their basic hiring and number of hours, as well as their years of seniority in the IPN, were observed. It is important to note that the tutor teachers were always willing and interested in collaborating with this research that addressed the problems presented in relation to tutoring in recent years.

The experience was divided into three stages: the first focused on the design and application of a diagnostic questionnaire to the five participating teacher tutors, before exploring and using the e-tutoring resources. The diagnostic instrument was composed of 13 open questions, the objective of which was to identify the position of the tutor teachers during the experiences of the PIT program at the IPN, that is, the conception of tutoring, the conditions and tools available, as well as the obstacles in tutorial work. Table 1 shows some of the questions that constituted the diagnostic questionnaire.

**Table 1.** Diagnostic questionnaire

Questions	
	What do you consider to be the most recurring problems among students? (Learning, economic, social, emotional problems)
	Based on your experience, is the information you collect at the end of the semester about your tutor susceptible to follow-up? How would having your history help the next tutor of said tutoring?
	What is the impact of ICT and in particular the tutor-tutee platform as a result of tutoring?
	From your experience, what information about the student is essential to start tutoring?
	What role does the IPN study regulations have in the tutorial action?
	Are the working conditions in space and time ideal? If not, please comment on your proposal.

Source: self made

The purpose of the instrument was to identify information about the position of tutor teachers related to the PIT program, that is, a general analysis from the conception of tutoring within the framework of the program to the conditions and tools available, as well as the obstacles in their tutorial work.

The second stage was aimed at the completion of the PIT system, with the implementation of the proposed sections, which lasted 4 weeks. A case study was selected that allowed tutors to recognize a particular event of a tutor, and offered virtual tools to support the teacher in their role as tutor.

The third stage focused on the design and application of a questionnaire to analyze the case study and assess the efficiency of the resources offered in the PIT system, as seen in Table 2, with the presentation of some of the most significant questions.

**Table 2.** Post-experience questionnaire

Questions	
	Do you consider the information on the e-tutoring platform useful? Justify
	Are the resources offered sufficient to facilitate your work as a tutor? Justify
	Does the platform contribute to the resolution of some problems, such as the coincidence of schedules between you and the tutor?
	What would you do to improve this digital resource, so that it becomes a better support for tutors?

Source: self made

The ages of the tutor teachers (participants) ranged between 30 and 72 years, and their length of service at the IPN was between 6 and 30 years. Of them, 3 teachers had a doctorate, one a master's degree and one a bachelor's degree.

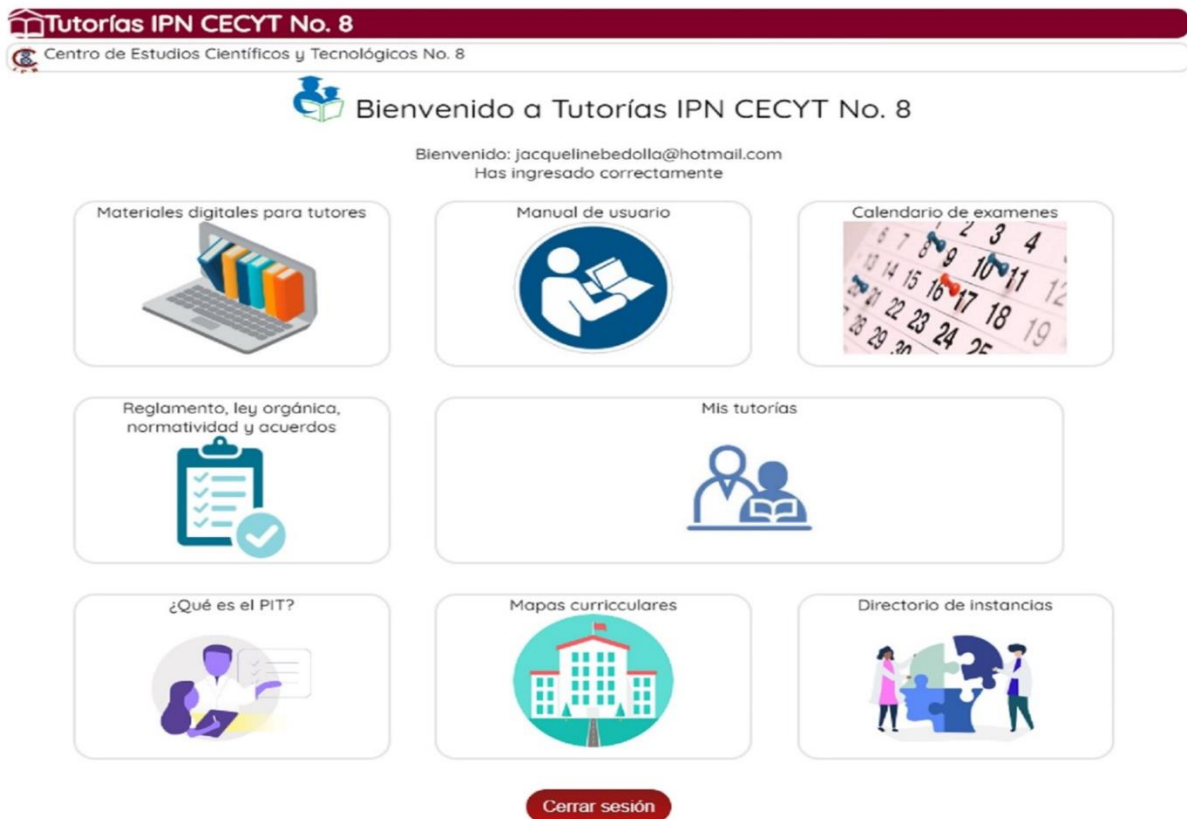
It was essential to recognize and explore the resources in the PIT requirements, both for tutors and tutees, with the aim of benefiting the tutorial process as a whole. This included the work of the tutor teacher, and the organization and systematization of these resources was carried out using the e-tutoring tool.

In this context, the academic, virtual, social and emotional needs of the students were identified and examined in relation to the educational supports and the requirements detected, especially with regard to accompaniment, evaluation and monitoring of their school career. This requires that tutor teachers recognize the personal characteristics of each tutor to promote the development of the student's abilities and skills effectively.

The improvement of the PIT system made it possible to manage various areas of academic guidance to address and resolve individual problems that may arise during the tutorial process. Both academic and personal knowledge of the student, together with a continuous dialogue with the student, will be essential to identify the best strategies that contribute to collaborating with him and establish guidelines for the work between the tutor and the tutee.

Based on these premises, the PIT system was designed and improved, the structure of which is shown in figure 1. This is the main page of the tutoring system, created with the *software* Xampp; It presents the available resources that contribute to improving the performance of the tutor teacher.

Figure 1. Main screen of the PIT (IPN) site tutorials



Note: Resources available to enrich tutor teaching performance.

Source: self made

The tutor teacher was trained in the different aspects of improving the PIT system with the purpose of becoming a specialist equipped with the necessary information. This involved considering resources that would allow him to make decisions as an expert, to guide the tutor in the adaptation process, so that they could understand the world around them by promoting their autonomy in the educational process.

In this sense, the proposal was structured as follows: user manual, what is the PIT?, exam calendar, digital materials for tutors, digital resources for tutors, regulations, organic law, regulations and agreements, curricular maps and instance directory, my tutorials (forums) and tutor training. The sections are described below:

*What is PIT?* It presents the teacher with information about the structure, content and operation of the program, as well as the regulations, objectives and tasks attributed to the tutor. This role is supervised according to the institutional framework, for which the instructional design of the program will be available.

*My tutorials (forum).* The section provides initially a diagnostic questionnaire aimed at investigating the socioeconomic, school and cultural context of the student. Therefore, it is highly recommended to identify, from the initial interview, the students' academic background

and achievements, difficulties detected, etc. In this forum, permanent communication between the tutor teacher and his tutored students is supported.

*Exam schedule.* It is the space in which the dates of ordinary, extraordinary and sufficiency evaluations are updated.

*Digital materials for tutors.* This space allows the tutor to share suggestions for activities, videos, tutorials, etc., as well as other support materials that can provide support elements, work guidelines and even ask possible questions regarding their tutorial work.

*Digital resources for tutors.* The tutor develops a work plan for the student, which is adjusted during the tutee recognition process. This implies guiding institutional actions by providing a series of documents that allow, in addition to complying with administrative issues, to point out findings and coincidences to demonstrate the progress and evolution of the process, which is why they are essential for the monitoring and evaluation of both actors.

*Regulations, organic law, regulations and agreements.* Various official documents are available that adjust to the fulfillment of the mission of the IPN, so institutional documents are presented from the regulations, such as the Organic Regulations of the IPN, which allows the tutor teacher to act within the regulatory framework of the IPN, as well as the *Directory of instances section* to support the tutor from the framework of physical and emotional health; at the institutional level (Interdisciplinary Center for Health Sciences, Santo Tomás Unit and Milpa Alta Unit) and at the external level (National Institute of Social Security and Health Center for Gender Equity and Reproductive Health).

*Curricular maps.* They show the maps with the learning units, the value in credits, etc.

*Tutor training.* Provides information on training activities in which teachers can participate for their training and tutorial development, such as diploma courses, conferences, congresses, seminars and courses. This provides training in the necessary skills so that the student can carry out self-management and learn autonomously.

It is important to note that the teacher requires training as a tutor to detect needs and diagnose cases, so that he can respond in a flexible and professional manner to unforeseen and complex situations, and even take advantage of the students' knowledge and skills (Tünnermann and De Souza, 2003).

Therefore, a section called *My tutorials was designed*, which is displayed in figure 2, with the purpose of having the necessary information about each student; In addition, a forum was established for permanent dialogue between the tutor and his tutees.

**Figure 2.** My tutorials. Consultation schedules, as well as suggested readings

The screenshot shows a web browser displaying a page titled 'Tutorías IPN CECYT No. 8'. The page has a navigation menu with 'Inicio', 'Física', 'Química', and 'Matemáticas'. Under 'Matemáticas', there are sub-links for 'Algebra' and 'Cálculo'. Below the menu is a graphic of two people studying at a desk with a laptop. A 'Regresar' button is visible at the bottom of the graphic.

Below the graphic, a Google Drive link is shown: <https://drive.google.com/file/d/1Vt7NtNF6DRXGwLV1dHhVfYKvmpYc2/view>. This link points to a document titled 'Horarios de asesorías de Matemáticas Enero-Junio 2020'.

	Lunes	Martes	Miércoles	Jueves	Viernes
<b>Geometría y Trigonometría (Álgebra)</b>	CUBICULOS DE MATEMÁTICAS				
Maria Eugenia Flores Olvera			9:00 a 11:00	9:00 a 10:00	9:00 a 11:00
Arturo Neumann Martínez		18:00 a 19:00 Salón 10	18:00 a 20:00 Salón 10		11:00 a 15:00
Guillermo Carrasco García		15:00 a 16:00	15:00 a 16:00	15:00 a 16:00	15:00 a 16:00
Pablo Zamarrá Guzmán	14:00 a 16:00	16:00 a 17:00		14:00 a 16:00	
<b>Cálculo Diferencial (Geometría Analítica)</b>	CUBICULOS DE MATEMÁTICAS				
Ulises Bonilla Jiménez	9:00 a 10:00		9:00 a 10:00	9:00 a 10:00	
Hermenegildo Banaera Hernández	13:00 a 15:00		14:00 a 15:00	12:00 a 13:00	12:00 a 13:00
Araceli Pérez Pimentel				16:00 a 18:00	
Xochitl Ramírez Marquina					16:00 a 18:00
<b>Probabilidad y Estadística (Cálculo Integral)</b>	CUBICULOS DE MATEMÁTICAS				
José Antonio Cortés Pérez		12:00 a 13:00	11:00 a 13:00		12:00 a 13:00
Elsa Magdalena Chirinos Arredondo	11:00 a 12:00		10:00 a 11:00	9:00 a 10:00	
Cristal Sofía Rincón Ruiz				9:00 a 11:00	
Jesús Alejandro Areco Hernández			17:00 a 18:00		

Source: self made

On the other hand, figure 3 shows a space for the tutor called “Digital materials for tutors”, in which various support resources, activity suggestions, videos, tutorials, etc. are presented. The purpose was to strengthen the training of tutors to have guidelines for the tutorial process or to consult possible doubts regarding the work carried out.

**Figure 3.** Digital materials for tutors



Source: self made

The different sections aim to monitor the student from entry to exit, using tools and strategies built through systematized actions of accompaniment, support, personalized monitoring and evaluation. These strategies, when personalized, allow the tutor to get to know each of his tutees in various dimensions in order to cultivate and develop the capabilities and aptitudes of the young people. To achieve this, it is crucial to carry out a diagnosis that includes knowledge of the student's first stages in the institution and their progress throughout their academic career. This diagnosis provides a basis for identifying the tutor and referring them to the appropriate academic support areas to address and follow up on any problems that may arise. Figure 4 presents the initial diagnosis of tutoring, which includes an analysis of the student's socioeconomic, school and cultural context, in addition to curricular aspects such as academic performance and identified difficulties, etc.



**Figure 4.** Initial diagnosis (tutored)

Ninguna Categoría

**FORMATO DE ENTREVISTA DATOS PERSONALES** Añadir - +

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ARUNDO

 **Descarga el navegador Chrome**  
instalación offline, políticas basadas en dispositivos y más. Implementa el MSI de Chrome MÁS INFORMACIÓN

---

**DATOS PERSONALES**

Nombre : \_\_\_\_\_  
 Estatura: \_\_\_\_\_ Peso: \_\_\_\_\_ Carrera: \_\_\_\_\_  
 Fecha de Nacimiento \_\_\_\_\_ Sexo \_\_\_\_\_ Edad \_\_\_\_\_  
 Estado civil \_\_\_\_\_  
 Soltero \_\_\_\_\_ Casado \_\_\_\_\_ Otros \_\_\_\_\_ Especifique \_\_\_\_\_  
 Trabaja : Si \_\_\_\_\_ No \_\_\_\_\_ Especifique \_\_\_\_\_  
 Lugar de Nacimiento : \_\_\_\_\_  
 Domicilio Actual : \_\_\_\_\_  
 Teléfono \_\_\_\_\_ C. P. \_\_\_\_\_ E-mail \_\_\_\_\_

---

**DATOS FAMILIARES**

Tipo de Vivienda: Casa \_\_\_\_\_ Departamento \_\_\_\_\_  
 La casa o departamento donde vives es:  
 Propia: \_\_\_\_\_ Rentada: \_\_\_\_\_ Prestada: \_\_\_\_\_ Otros: \_\_\_\_\_ Especifique: \_\_\_\_\_  
 Número de personas con las que vives \_\_\_\_\_ Parentesco: \_\_\_\_\_  
 Nombre del Padre \_\_\_\_\_ Edad: \_\_\_\_\_  
 Trabaja: Si \_\_\_\_\_ No \_\_\_\_\_ Profesión: \_\_\_\_\_  
 Ocupación (A que se dedica) \_\_\_\_\_  
 Domicilio: \_\_\_\_\_  
 Teléfono: \_\_\_\_\_  
 Nombre de la Madre: \_\_\_\_\_  
 Profesión: \_\_\_\_\_ Ocupación: \_\_\_\_\_  
 Domicilio: \_\_\_\_\_ Teléfono: \_\_\_\_\_

---

Nombre de tus hermanos por edad (del mayor al menor incluyéndote tú)

	Nombre	Edad	Sexo	Estudios
1				
2				
3				
4				
5				

A cuánto ascienden los ingresos mensuales de tu familia \_\_\_\_\_  
 En caso de ser económicamente independiente a cuánto asciende tu ingreso \_\_\_\_\_

ARUNDO

Source: self made

Knowing their background turned out to be more effective at work, as well as establishing guidelines during the tutor's monitoring. It also helped set a precedent for the next tutor teacher, in case there was a change per semester, which meant having a solid foundation to start the process and optimize time in caring for the young person.

To do this, the tutor must present a work plan in order to present the organization of the sessions related to the time and space of the tutorials. In this way, an effort is made to provide feedback in a timely manner based on the information and guidance provided by the PIT system, and appropriate to the needs of the tutor, as well as the design of practical activities in which the student is placed in scenarios to reflect, make decisions and contribute to the designed situation.

The record of the tutor's progress and work is issued through administrative processes through formats. These present the student's situation and demonstrate the strategies carried out based on the resources presented in the PIT system. To continue the process, the tutor must present a report to the program authorities in order to make decisions and possible solutions to the problem presented, which is achieved with the information presented by the tutor teacher.

It is important to mention that the teacher tutors were provided with laptop computers during the three phases of the experience to explore and use the communication environment (supported by the free XAMPP *software*) of e-tutoring.

### Results and analysis

In the diagnostic questionnaire to the tutor teachers, significant positions regarding the PIT system were evident; one of them is seen in table 3.

**Table 3.** Diagnostic questionnaire of the first phase, prior to the use of the experience

In your experience, what are the obstacles that the PIT tutor faces?	Percentage	Position of tutor teachers
	33%	Lack of spaces to develop the tutorial process
	33%	Lack of time for tutorial activities
	17%	Teacher availability
	17%	Student Availability

Note: Teachers identify elements to strengthen permanent communication with the tutor.

Source: self made

The participating teachers mention limitations in two areas: first, the lack of physical spaces to carry out the tutorial action; second, the availability of both teachers and students to fulfill the commitments acquired under this program.

Another situation that limits tutorial performance is the general profile of the student, since, according to the tutors, knowledge of the student's health status (physical and mental) is essential, which directly impacts their academic performance. Secondly, they expose the importance of recognizing the academic career as a background and problem areas; Thirdly, it is advisable to take into account contact information of a family member to anticipate any uncontrolled situation; Finally, the tutor's history is required in the academic, virtual, social and emotional fields with the intention of finding out if he or she was subject to a behavior report, suspension, absence from the classroom, health reports, problems with teachers, etc.

In this context, the case of a student A (hypothetical) was presented with the purpose of evaluating his academic career at the educational center and analyzing possible support strategies that contribute to solving the situation through the resources and tools offered in the space. virtual.

To better understand, it is relevant to describe the hypothetical situation of student A, who has just entered the IPN upper secondary level system (NMS) in person. Despite having a good average in high school, this student faces difficulties with academic responsibilities and time management, which includes the period it takes to travel from home to school; Furthermore, it is overloaded due to the teachers' demands. These difficulties have caused a lack of motivation and absenteeism in the subjects Algebra, Oral and Written Expression, and Orientation, which ultimately results in his failure. In particular, in the subjects of Algebra and Written Expression, the student mentions having problems understanding the content due to the lack of organization of his time and his study habits.

Given this situation, the tutor teachers carried out a personalized analysis of the resources provided by the PIT system. This included the review of the curricular maps, the forum space, the directory of instances to channel students, the advisory schedules, the relationship between tutors and students, recommended readings related to study strategies, as well as the regulations and formats that make up the PIT, in face-to-face sessions.

After exploring the PIT system, the tutor teachers focused on the resources related to the regulations, the organic law, the regulations, and the curricular map to analyze the student's academic trajectory. This information was essential for making decisions in response to the challenges faced by the student.

Once the experience was concluded, a questionnaire was administered to the tutor teachers in the third stage of the research to analyze the case study and evaluate the effectiveness of the resources provided by the PIT system. One of the key questions was the following: what e-tutoring resources did they use to evaluate the student's situation and in what way can the PIT contribute to the tasks of the CECyT 8 Narciso Bassols teacher tutors?

According to the exploration and strategies developed to support student A, tools were used that had a significant impact on the work of the tutor teachers. These tools included the use of forums to establish a continuous dialogue with the tutors, the provision of readings related to study strategies and materials of various learning units, consultation of the general study regulations, the review of advisory schedules for both teachers as student advisors, time organization, study habits and access to the directory of instances to address family and health problems.

The tutors considered it crucial to have reliable information about the health and family situations of the tutees that could influence their academic performance and their lives both in the institution and outside of it. These factors were revealed as determining elements in the strategic planning of the tutor teacher's tutorial work.

Table 4 presents information from the perspective of the tutor teachers, which highlights the importance of having details about the academic history, problem areas and performance in

previous semesters in the students' school life. This information turned out to be essential to design strategies in the tutorial work.

**Table 4.** Opening information in the tutorial process from the view of the tutor teacher

What type of information from the tutor will be necessary to start the tutoring?	Percentage	Tutors' proposals
	22%	Academic performance and problem areas
	22%	Academic background; reports, suspension, absence from class, etc.
	45 %	General information; economic, health and family
	11 %	Family contact details

Note: Relevant aspects to consider at the beginning of the tutorial action.

Source: self made

From the view of the tutor teacher, the need to have specific information about the tutor at the beginning of the process provides transcendental aspects in the tutorial process, mainly in the contribution to reducing school dropouts. This also allows for the development of a work plan to design activities that increase the student's systematic study habits and learning methodologies, as well as offering the student personalized support schedules during their school career, supporting them with cognitive strategies (Béjar, 2018).

Regarding the feedback of the sections that make up the PIT, table 5 shows the tutor's vision to enrich the sections.

**Table 5.** Relevant sections (PIT) from the view of the tutor teacher

Would you include any more sections or tabs in the e-tutoring platform (Xampp software)?	Percentage	Tutors' proposals
	50%	Intertutors forum
	17%	Motivational videos
	33%	Frequently asked questions section for tutors outside the regulations

Note: Teachers identify elements to strengthen permanent communication with the tutor.

Source: self made

Table 5 shows that 50% request a forum where teachers can exchange experience and have communication about the groups. 33% would add a section of frequently asked questions for tutors outside the regulations, since they express that it is difficult to guide them on these topics; 17% proposed placing a tab that includes videos for tutors and tutees, with a motivational section. The purpose would be to reinforce communication spaces with the tutees and the tutor.

In addition, communication with authorities, teachers and parents is emphasized to contribute to the objectives of the educational process, addressing the different aspects that can directly or indirectly influence the student's school performance.

In this context, the scaffolding and the ZDP, according to the perception of the tutor teachers, highlighted the importance of virtual support to guide students through various visual media, such as forums, WhatsApp, chats, email, educational platforms, video tutorials, among others. In this sense, it should be noted that students are more familiar with these digital media, which makes it impractical to carry out tutoring in person due to limitations in terms of schedules and locations for both parties involved in the process.

Ultimately, the components of e-tutoring in the PIT are fundamental elements of support for the tutor teacher in their interaction with students. They become evident when the opportunity is provided to enrich the platform with contributions from participants, allowing progress in student self-management to be monitored. This process begins with constant interactions to strengthen the communication and empathy of the tutor teacher in the tutorials with the final objective of promoting the independence of the students (Delgado-García *et al.*, 2020).

However, the teacher tutor finds in the systematization of these elements the necessary instruments to strengthen and develop their skills within the framework of the institutional program. This is essential given the dynamic nature of continuous improvement and enrichment of the sections that make up the PIT, which has a significant impact on the mentoring process.

## Discussion

The relationship between the teacher tutor and the tutee has been limited for years to face-to-face meetings and face-to-face sessions. However, today it is possible to incorporate other strategies that encourage constant virtual contact without space or time limitations, although this requires the tutor to generate a paradigm shift in their way of working, as well as training in the use of ICT.

To this end, the platform described in this research incorporates forums, online registration of records, attendance and official documents concerning health, regulations, curricular maps, etc. This information contributed to the approach of the case study presented to the tutors based on the responses issued by the tutors.

In addition, the implementation of innovative resources was evaluated, such as the one proposed by López-Gómez (2017), who used Google Groups with the purpose of demonstrating the positive impact of virtual tutoring as a complement and support. Similar to this study, the results revealed a difference, in this case, quantitative, particularly in the overall grades of

students who received support through the online tutoring modality. In this sense, it should be noted that the page interface is simple and intuitive, which translates into an optimization of the use of time and resources, which, according to the tutors, are limited for both parties. In this way, a commonly used tool for tutors is taken advantage of.

On the other hand, it should be noted that the virtual space is valuable because it provides tutors with the necessary information to carry out their role. In addition, it facilitates communication with students in a synchronous and asynchronous manner, offering the possibility of expressing themselves freely. At the same time, the tutor can keep track and record the follow-up with the tutor, which is beneficial for the coming semesters.

According to Chi *et al.* (2001), the support of the tutor teacher allows the contributions made on the platform to be enriched, which reflects the advances in the self-management processes acquired by the tutor. In this way, regular interactions strengthen dialogue and empathy between participants in the tutorial process.

Likewise, the tutor teachers mentioned the existence of sufficient and necessary regulatory documents to prevent possible violations of students' rights. Knowing the absences allows them to channel students to the corresponding authorities to receive relevant guidance in their academic career, since, in many cases, the problems of the tutors go beyond the scope of the tutor's professional training.

Finally, difficulties in e-tutoring included the lack of a site's own domain, which led to the use of two computers. The limited skills in the use of ICT by some tutors and problems with coverage were also highlighted. Therefore, it would have been more beneficial to carry out the experience with real cases and make a comparison between a teacher tutor who had access to these resources and another who did not.

On the other hand, it can be stated that the design of this tool is beneficial for the development of the PIT, since it allows exploring the foundations, objectives and scope of the program from the perspective of the vision and mission of the IPN, supported by the regulations that govern it. sustains In this sense, the platform offers tutors the ability to investigate, analyze, discuss and make decisions to propose solutions to the challenges they face in their daily work, such as the coordination of schedules, the availability of physical spaces to carry out the tutoring and ignorance of school administrative processes, among others.

As a result, the proposed website provides a wide range of resources to strengthen and develop the skills and abilities of all those involved in the mentoring process through constant dialogue in face-to-face and virtual sessions. These resources, supported by information from the sections that make up the PIT, have a significant impact on the tutoring process (Mutekwe, 2008).

## Conclusions

Among the most notable findings, the lack of information about the organization of the program and institutional regulations was observed, hence the tutor teachers have indicated that they began their tutoring work without adequate knowledge of the PIT. Likewise, the majority of them expressed their concern about the overload of activities, and highlighted that they did not have specific time for tutoring or the necessary infrastructure to provide support to those tutored. In addition, they referred to the lack of willingness on the part of the students.

Based on this information, the content was designed and structured to support the work of the tutor teachers. There are numerous technological resources that can improve various aspects of the teaching and learning process, including tutoring. This allows the creation of innovative practices in a virtual environment that is not limited by space or time restrictions. In this regard, both synchronous and asynchronous approaches can be used, adapted to achieve effective results in technological interaction and student monitoring.

The design of this proposal provided the PIT with fundamental elements to strengthen the work of tutor teachers with the purpose of addressing the lack of information that these teachers faced in their tutoring activities. The communication environment provides various support resources that improve tutorial work, allowing students to self-regulate their needs and concerns, and develop skills to solve everyday problems.

The proposal contributed to providing tutor teachers with the necessary information to carry out the tutoring process effectively, facilitating communication with the tutees synchronously and asynchronously, and fostering an environment of respect, understanding, cordiality and empathy.

In summary, it is proposed that tutor teachers systematize each of the consultancies to exhaustively record progress and possible problems, storing this information for continuous use in the institution. In addition, it is suggested to establish follow-up between tutors from different semesters, which would further optimize the resources and time available.

## Future lines of research

The design and implementation of this proposal in the context of the Institutional Tutoring Program, supported by the previously mentioned findings, is perceived as feasible within the IPN environment. This viability is based on the availability of existing resources, such as access to Wi-Fi networks, computers in the library areas and the possibility of collaborating with the IT Unit to host the site in a public domain, accessible from any personal computer.

Furthermore, the resources related to e-tutoring prove to be a valuable support for the tutorial work, as emphasized by the tutor teachers. Their opinion highlights the wealth of information necessary to support and guide tutees at all stages of their comprehensive training. This guarantees the integrity and privacy of the data, which is essential to continually strengthen professional learning and meet the requirements that the current productive sector demands.

Therefore, it is suggested to maintain a dynamic and continuous investigation or consider the possibility of undertaking future investigations, taking into account the following:

- The perspective of tutored students regarding the intervention of tutors with complementary virtual resources.
- The comparison of academic results between groups that have a tutor who carries out only face-to-face work and those who are complemented with virtual resources.
- Process analysis in a group with technological resources, continuous evaluation for a semester.
- Challenges of managing virtual resources after several semesters of use in order to update the available resources.
- Measurement of student satisfaction with respect to tutors who used ICT and those who did not.

Based on the above, an institutional tutoring model must be designed that can precisely contemplate the tutor's profile, where the activities to be carried out, as well as the obligations to which the tutor is subject, are exposed. In this way, the tutorial action carried out with professionalism can be guaranteed. Likewise, virtual spaces should be promoted for tutorial action that address health, knowledge and institutional identity, among others, with the aim of giving the student permanent access to these spaces during their stay at the institution.

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Methodology	Alma Alicia Benítez Pérez (same) and Jacqueline Bedolla Sámano (same).
Software	Jacqueline Bedolla Sámano (main) and Alma Alicia Benítez Pérez (support)
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