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Artículos científicos

Estrategia basada en la evaluación auténtica para el desarrollo de competencias digitales en la formación inicial docente

Strategy Based on Authentic Evaluation for the Development of Digital Competences in Teacher Training

Estratégia baseada na avaliação autêntica para o desenvolvimento de competências digitais na formação inicial de professores

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Resumen

El desarrollo de las competencias digitales en la formación inicial docente es importante para las instituciones que están preocupadas porque sus egresados estén actualizados y capacitados para cumplir con las exigencias de la sociedad actual. El presente trabajo se centró en la planeación e implementación de tres materias optativas para estudiantes de la licenciatura en Psicopedagogía de la Universidad Autónoma de San Luis Potosí (UASLP). La propuesta curricular se basó en la metodología de la investigación evaluativa. El objetivo fue desarrollar las asignaturas con base en el enfoque de la evaluación auténtica de los aprendizajes: desde la selección del contenido hasta la evaluación de las competencias a desarrollar en cada materia. Los resultados demostraron que al cursar las tres materias se



desarrollaron las siguientes competencias en los estudiantes: información y alfabetización informacional, comunicación y colaboración, creación de contenido digital, seguridad y resolución de problemas. Además, la autopercepción de las competencias digitales fue de un nivel intermedio a avanzado, y los estudiantes reconocieron el vínculo entre lo que aprenden en su proceso formativo y lo que realizarán en su práctica profesional.

Palabras clave: competencias del docente, formación del docente, evaluación de la educación, tecnología educativa, TIC.

Abstract

The development of digital skills in initial teacher training is important for institutions that are concerned that their graduates are updated and trained to meet the demands of today's society. The present work focused on the planning and implementation of three elective subjects for students of the Bachelor of Psychopedagogy at the Universidad Autónoma de San Luis Potosí (UASLP). The curricular proposal was based on the methodology of evaluative research. The objective was to develop the subjects based on the approach of authentic evaluation of learning: from the selection of content to the evaluation of the competencies to be developed in each subject. The results showed that when taking the three subjects, the following competencies were developed in the students: information and information literacy, communication and collaboration, creation of digital content, security and problem solving. In addition, the self-perception of digital skills ranged from an intermediate to advanced level, and the students recognized the link between what they learn in their training process and what they will do in their professional practice.

Keywords: teacher qualifications, teacher education, educational evaluation, ICT, educational technology.

Resumo

O desenvolvimento de competências digitais na formação inicial de professores é importante para instituições que se preocupam em que seus egressos sejam atualizados e capacitados para atender as demandas da sociedade atual. O presente trabalho se concentrou no planejamento e implementação de três disciplinas optativas para alunos da licenciatura em Psicopedagogia da Universidad Autónoma de San Luis Potosí (UASLP). A proposta curricular baseou-se na metodologia da pesquisa avaliativa. O objetivo foi desenvolver as disciplinas com base na abordagem da avaliação autêntica da aprendizagem: desde a seleção do conteúdo até a avaliação das competências a serem desenvolvidas em cada disciplina. Os resultados mostraram que as seguintes habilidades foram desenvolvidas nos alunos ao estudar as três disciplinas: competência informacional e informacional, comunicação e colaboração, criação de conteúdo digital, segurança e resolução de problemas. Além disso, a autopercepção das competências digitais foi de nível intermediário a avançado, e os alunos reconheceram a ligação entre o que aprendem em seu processo de formação e o que farão em sua prática profissional.

Palavras-chave: competências docentes, formação docente, avaliação educacional, tecnologia educacional, TIC.

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Introduction

At the moment in which a teacher enters a classroom to exercise his professional practice for the first time, he will use the knowledge acquired in his initial teacher training (IDT), which will allow him to function safely in the search for pedagogical objectives when interacting with your students. This knowledge will be their tools, turbines that will drive the teaching-learning process. There, precisely, lies the importance of everything to which he was exposed in his teacher training: of the skills that he developed and those that the institution was capable of transmitting in this formative stage.

Digital competences are a toolbox for teachers in training that accompany them both to carry out their academic activities, professional practices and social service, as well as in the preparation of their thesis to obtain their academic degree.

The development of digital skills is a challenge. In recent years, the best way to implement a strategy where students are involved without falling into merely technical courses has been sought. And in this line, during the FID, the pedagogical use of digital technology will be one of the pillars for the change towards a broader vision of educational technology.

To achieve the above, a congruence is needed between the thematic content, the activities selected for that content and the evaluation methods. For this reason, the authentic evaluation is selected, since it stands as a coherent alternative with what is proposed and what is evaluated, especially when it comes to competencies.

Teaching digital skills

The teacher needs to use information and communication technologies (ICT) thoughtfully. Along these lines, from a pedagogical dimension, the development of digital skills is essential. ICTs are a very powerful tool, not only for the representation and transmission of information; Perhaps the most valuable contribution comes when the teacher integrates them into the symbolic system, and this can be present in any educational setting, as long as the conditions related to the educational objectives that were planned exist. But for this to happen there must be an appropriation of these digital tools by teachers (Valencia et al., 2016).

Teaching digital skills (CDD) in the teacher are a necessity. In fact, for more than a decade the mastery of these skills has already been declared decisive. Since then, teachers have faced students from a generation that represented a cultural change in interaction and the communicational paradigm based on interactivity (Ministry of Education of Chile, 2009).

Currently, there is an exponential increase in communication through social networks by the new generations. In addition, the acceleration in dissemination, access and consumption of information and the constant appearance of elements such as augmented reality, virtual reality, memes, etc., have transformed culture, and as a consequence, have provoked the questioning of traditional models and forms of teaching. (Area, 2018).

Initial teacher training

The detection of needs in the FID requires a thorough process, from which sufficient information can be obtained to have a high degree of certainty regarding the challenges that the teacher will face in the classroom. Currently, there are no valuable elements for future decision-making and regarding the orientation of this type of program. In this regard, Gil (2018) highlights that "evaluation is urgent in initial teacher training systems, because this would help guide a pending reform, which will allow us to train teachers in coherence with the purposes of the educational reform as a whole." (p. 260).

In FID there is a factor that has been configured as fundamental when it comes to transforming educational practice: the use of ICT as a tool in teaching-learning processes. For several years this has become a reality and, in turn, a need for use by teachers in the profession.

The foregoing brings unfavorable consequences when implementing strategies where ICTs are incorporated into the teaching-learning processes. One of the main problems found by Sancho, Ornellas, Sánchez, Alonso and Bosco (2008) points to teacher training systems that impede educational change. In the same way, Pozos and Tejada (2018) consider the need to train teachers with a digital profile relevant: to give a meaning that goes beyond technological literacy or dissemination courses and that their progress is directed more towards the use of ICT in pedagogy. .

The FID should be an opportunity for future professionals to enhance the development of skills, abilities such as autonomy and commitment to educational practice; in short, to develop capacities and strategies to face the constant technological and social changes that are reflected in the school classroom.

Authentic evaluation

Competency assessment is one of the most complex processes. To mitigate this complexity, authentic evaluation is proposed here. This pedagogical practice tries to build meanings through the content and methods of evaluating learning.

Authentic evaluation is an alternative to change the way of evaluating that currently prevails, to turn around the use of static instruments that only explore declarative knowledge

of a factual type, as pointed out by Díaz (2006). Indeed, here the aim is to privilege the autonomous work of the student by incorporating active methodologies that tie in with the competency-based model (Vallejo and Molina, 2004).

In accordance with Díaz (2006):

The constructivist approach posits that there should be no break or gap between the teaching episodes and the assessment episodes. One of the main possible criticisms of the evaluation that is usually carried out in educational institutions is that there is no congruence between evaluation and teaching, that is, one thing is taught and another is evaluated. (p. 91).

For a better representation of what was mentioned in the previous paragraphs, table 1 lists the characteristics and conditions of authentic evaluation.

Tabla 1. Diferenciación de la evaluación auténtica

Enfoque	Características y condiciones
Evaluación auténtica	<ul style="list-style-type: none"> • Demanda que los aprendices resuelvan activamente tareas complejas y auténticas. • Usa conocimientos previos, aprendizajes recientes y las habilidades relevantes para la solución de problemas reales. • Busca evaluar lo que se hace. • Identifica el vínculo de coherencia entre lo conceptual y lo procedimental. • Hace un diagnóstico más adecuado de lo que el estudiante sabe y debería saber, así como de lo que desea saber. • Sigue el proceso de adquisición y perfeccionamiento de determinados saberes o formas de actuación. • Entiende cómo ocurre el desempeño de un contexto o situación determinada. • Valora los conocimientos, aptitudes y disposiciones de los alumnos y los confronta con circunstancias relativamente familiares.

- | |
|--|
| <ul style="list-style-type: none">• Permite al alumno manifestar su verdadero potencial induciéndolo a comportarse con naturalidad ante cualquier situación. |
|--|

Fuente: Elaboración propia con base en Díaz (2006)

Likewise, Díaz (2006) argues that formal written tests should be replaced and an alternative sought that allows for a change in the prevailing evaluation culture, which focuses on static instruments and only explores declarative knowledge. In this sense, it is pertinent to mention that there is currently a growing use of evaluation procedures that complement oral or written tests. Guzmán and Ortiz (2019) describe these procedures as a way to renew the evaluation process.

The evaluation will make sense when it represents for the students a real motivation for change. As mentioned by Díaz (2006), "authentic assessment focuses on learner performance and includes a variety of instruction-assessment strategies that are not only holistic but also rigorous" (p. 127).

Objective

The main objective of this research is to design a strategy for the development of digital skills in future teachers through three optional subjects based on authentic assessment. The following specific objectives emerge from the above objective:

- Plan subjects in the degree in Psychopedagogy at the Autonomous University of San Luis Potosí (UASLP) that develop the five CDD.
- Select and design the didactic content of the subjects based on the approach of authentic evaluation.
- Implement the subjects that develop the CDD in the students of the degree in Psychopedagogy of the UASLP.

Methodology

In the choice of methodology, following Murueta (2010), the eclectic should be avoided, where only what is most pleasing is chosen from the different alternatives that exist, because to explain, justify and demonstrate the validity of any location one has to mention how and why it got there, and not only that, it must also explain why it is still there.

The term qualitative has generally been used in two senses: as a quality that describes something and in a more complete or integral way, where the quality of some element is a set of qualities or the total quality of it. Qualitative methodology does not deal with the study of qualities separately, it deals with the study of an integrated whole that "forms or constitutes a unit of analysis and that makes something what it is" (Martínez, 2009, p. 173).

Consistent with the above, Sandín (2003) considers that "the quantitative versus qualitative research debate has lost virulence, and most authors are in an integrative and complementary position" (p. 18).

For their part, Correa, Puerta and Restrepo (2002) attribute the specific method of evaluation to evaluative research, "where the tools of social research are put at the service of the ideal consisting of making the judging process more precise and objective" (p.31). Evaluative research does not intend to oppose a quantitative perspective in research, it only defends the idea that there are different methodological options and it is carried out in order to obtain substantiated results for decision-making after research, as Escudero declares. (2016).

Being part of a research process, the evaluation establishes clear and specific criteria that guarantee the success of the process; systematically gathers information, evidence and testimonies from a representative sample of the audiences that make up the program or object to be evaluated; translates this information into evaluative expressions and compares them with the initially established criteria, and finally draws conclusions.

Suchman (1967) makes a differentiation between the objectives and investigative powers of evaluation, and contrasts them with basic or pure research; it is a "complex mixture of different values, purposes and resources" (p. 71).

Based on what was stated in the previous paragraphs, the methodological design based on evaluative research was defined. It is the one that best suits for this research work due to the nature of valuation for the strategy.

In this proposed strategy, the work was concentrated on the development of three optional subjects for students of the degree in Psychopedagogy of the UASLP.

- Optional one: "ICT in education".
- Optional two: "Virtual teaching-learning environment (Evea) and educational platforms".
- Optional three: "Creation of digital educational resources".

The students of the three optional subjects proposed in the study were distributed as shown in Table 2. Here it should be clarified that the optional subjects are only offered for students who are in the sixth semester onwards and the course load it is subject to availability and where the first to select are those students with the best average.

Tabla 2. Distribución de estudiantes por materia optativa

Materia optativa	Núm. de estudiantes
1) Las TIC en la educación	12
2) Enea y plataformas educativas	29
3) Creación de recursos educativos digitales	27
Total	68

Fuente: Elaboración propia

The phases to carry out the strategy were the following:

- 1) Planning of optional subjects.
- 2) Selection of content and evaluation methods.
- 3) Implementation.

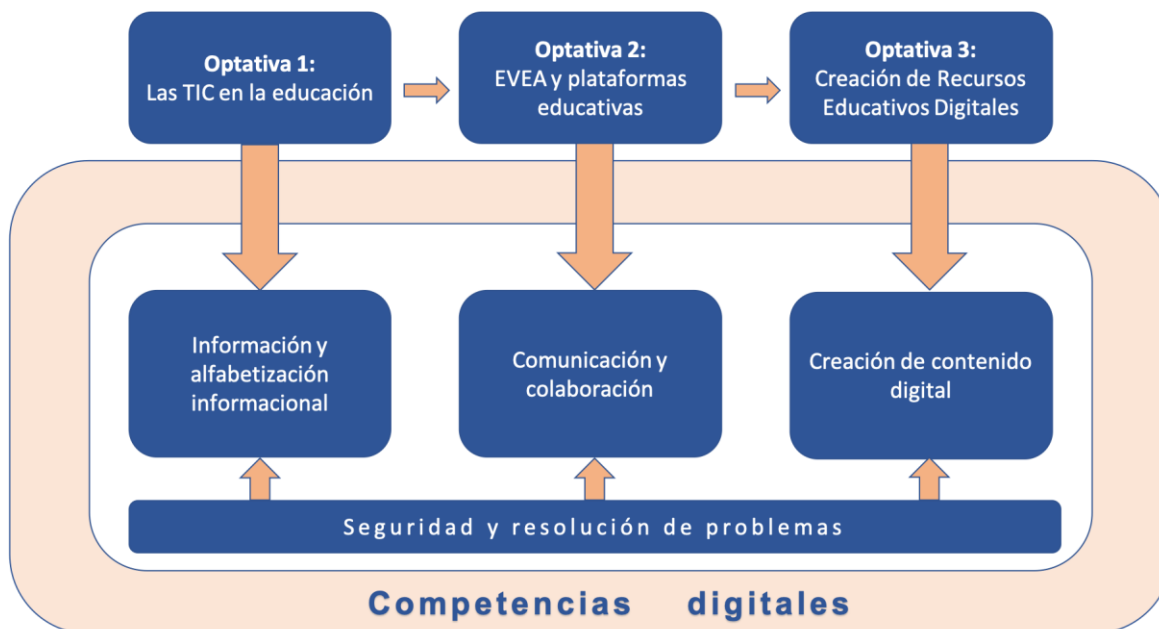
Phase 1. Planning of optional subjects

Planning, development and evaluation are carried out based on the authenticity approach, because, as Jalo and Pérez (2016) mention, the concept does not only refer to evaluation, but also to the learning that is generated by teaching and evaluating.

When talking about competency evaluation, aspects such as the acquisition of knowledge, skills and attitudes must be taken into account, aspects that are difficult to cover for traditional evaluation (Córdoba, 2013).

The digital skills to be developed through the proposal of the aforementioned subjects are illustrated in Figure 1.

Figura 1. Distribución de las competencias digitales que se desarrollan en la propuesta de las materias optativas



Fuente: Elaboración propia

It is true that there are no pre-established unique or suitable didactic situations when teaching or evaluating competencies; it is necessary to recreate them with the greatest authenticity possible with their own cases or problems in accordance with the practice of the profession (Díaz, 2019, p. 55).

Phase 2. Content selection and evaluation methods

The selection of the content was based on the idea that education has focused on results, but has left aside the means by which learning is achieved, and priority was given to these means to be able to develop the competences raised from a start in each of the proposed subjects.

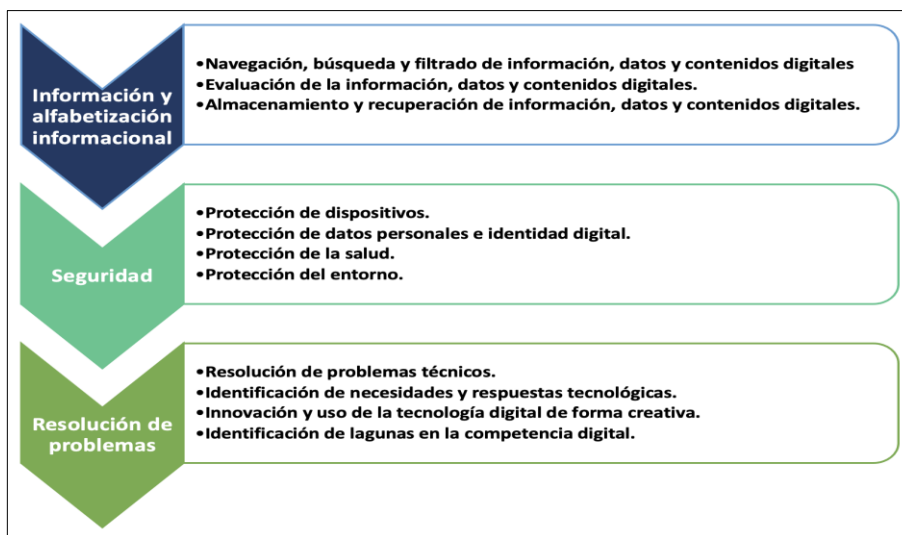
In accordance with the above, a triad is recognized that includes the teacher, the students and the content of the subjects, which will form a series of links or interweaving for the construction of knowledge. Likewise, Litwin (2009) maintains that three forms of technology use are identified: "according to the place assigned to the teacher, according to the conception of the subject of learning that is assumed and according to the sense with which the content is understood. in teaching" (p. 22).

This section focuses on the process of identifying, selecting and designing the content of each of the optional subjects proposed. Similarly, the definition of evaluation methods. As mentioned in previous paragraphs, the didactic proposals must be as authentic as possible, that the activities solve problems attached to the practice of the profession. For this, authentic assessment is ideal.

From a general perspective, the tasks that teachers perform at the time of transmitting the contents are analyzed. First they select, then they order and prioritize the information, says Litwin (2009). This process requires a critical look to identify whether the information considered to be used is relevant or adequate, taking into account the context, the grade and, in this case, the competencies that are intended to be developed in the students.

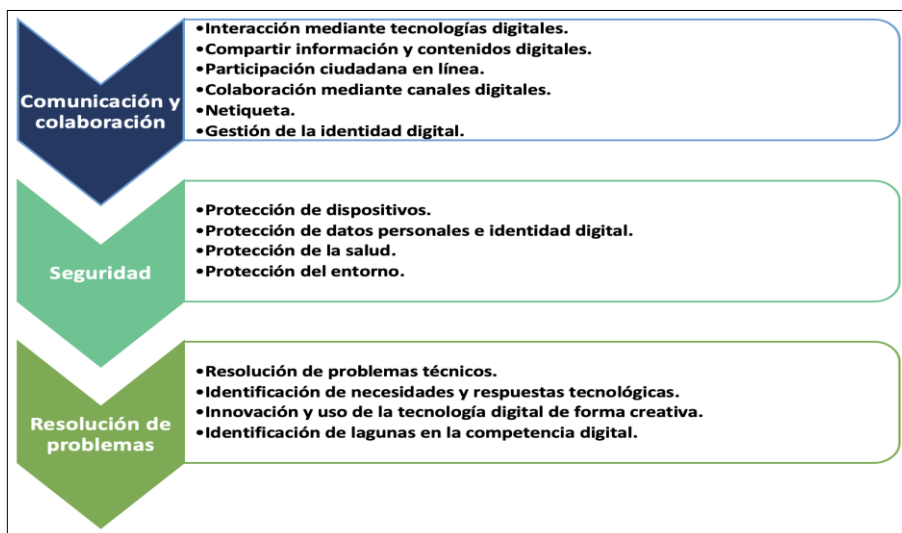
In line with the above, the contents of each of the optional subjects were selected considering the skills that were planned to be developed in them, and in accordance with the Common Framework for Digital Teaching Competence dictated by the National Institute of Educational Technologies and Training of the Teachers [Intef] (2017), were distributed as shown in figure 2, figure 3 and figure 4.

Figura 2. CDD que se desarrollan en la materia optativa “Las TIC en la educación”



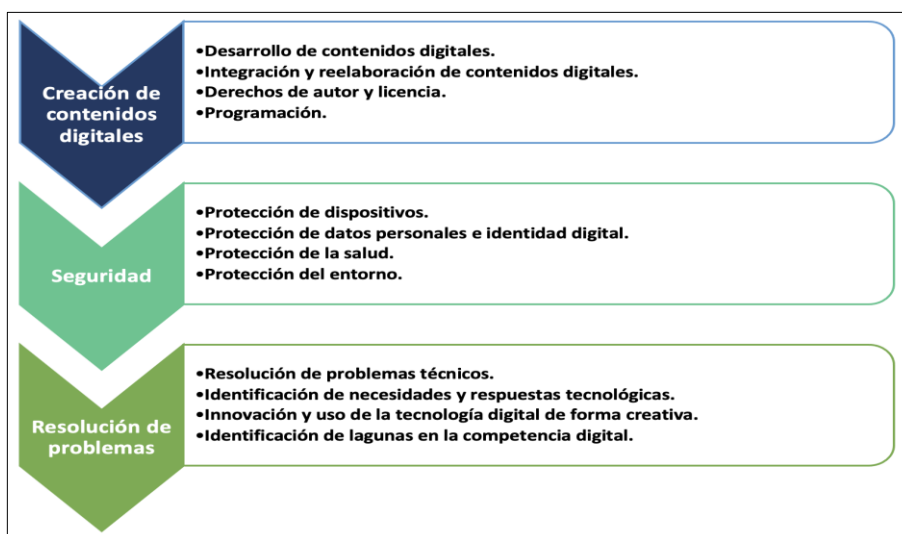
Fuente: Elaboración propia

Figura 3. CDD que se desarrollan en la materia optativa “Evea y plataformas educativas”



Fuente: Elaboración propia

Figura 4. CDD que se desarrollan en la materia optativa “Creación de recursos educativos digitales”



Fuente: Elaboración propia

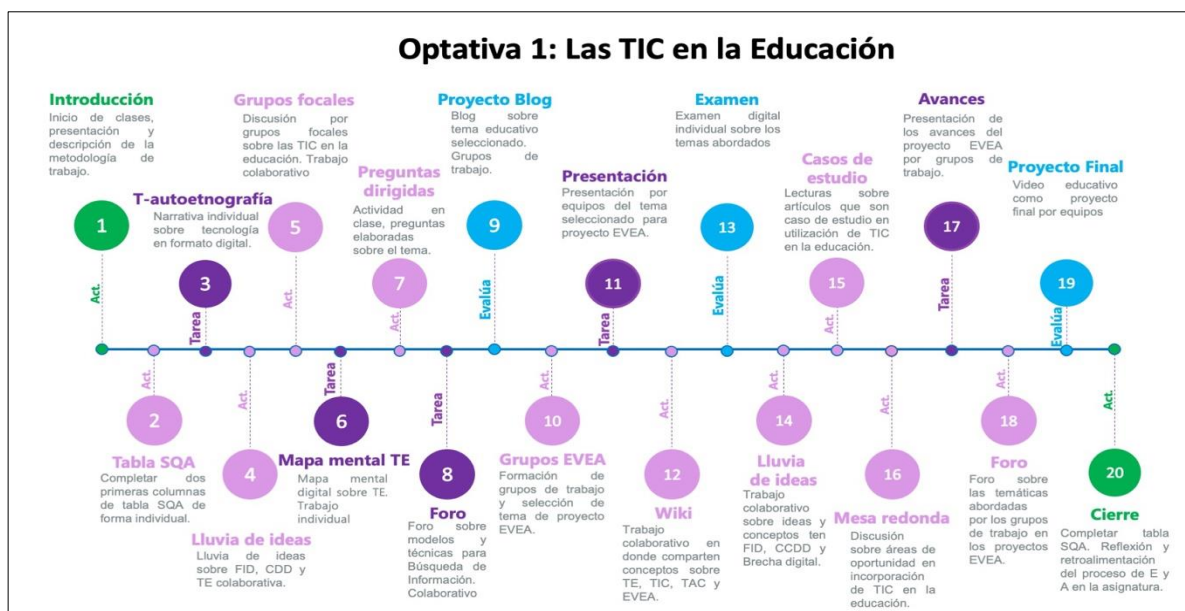
Phase 3. Implementation of optional subjects

Elective subjects, as established by the regulation of the degree in Psychopedagogy of the UASLP, are available to students from the sixth semester and are offered in accordance with the order of the list based on their general average. The foregoing in order not to have an overcrowding in some of them and to prevent others from being without students.

After selecting the thematic content in the subjects, the approach was for the students to recognize and delve into particular things about their professional practice as future educational psychologists, where problem solving was involved that caused learning through observation or imitation of the use of digital technologies in scenarios very similar to their praxis.

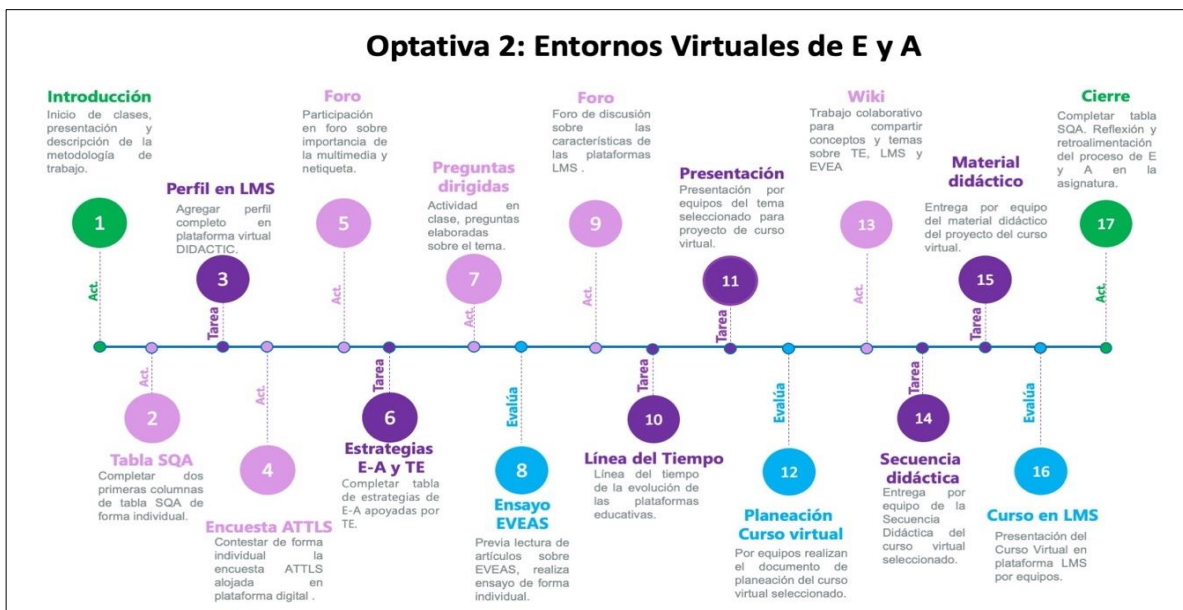
The subjects were divided into three partials, for academic and administrative reasons. In each part, an attempt was made to implement a set of activities, tasks and project execution so that a simple numerical weighting was not carried out, but a formative evaluation with different instruments and, in turn, to be able to evaluate the competences that were planned for each of the subjects, as can be seen in figure 5, figure 6 and figure 7.

Figura 5. Secuencia de actividades desarrolladas en la materia optativa “Las TIC en la educación”



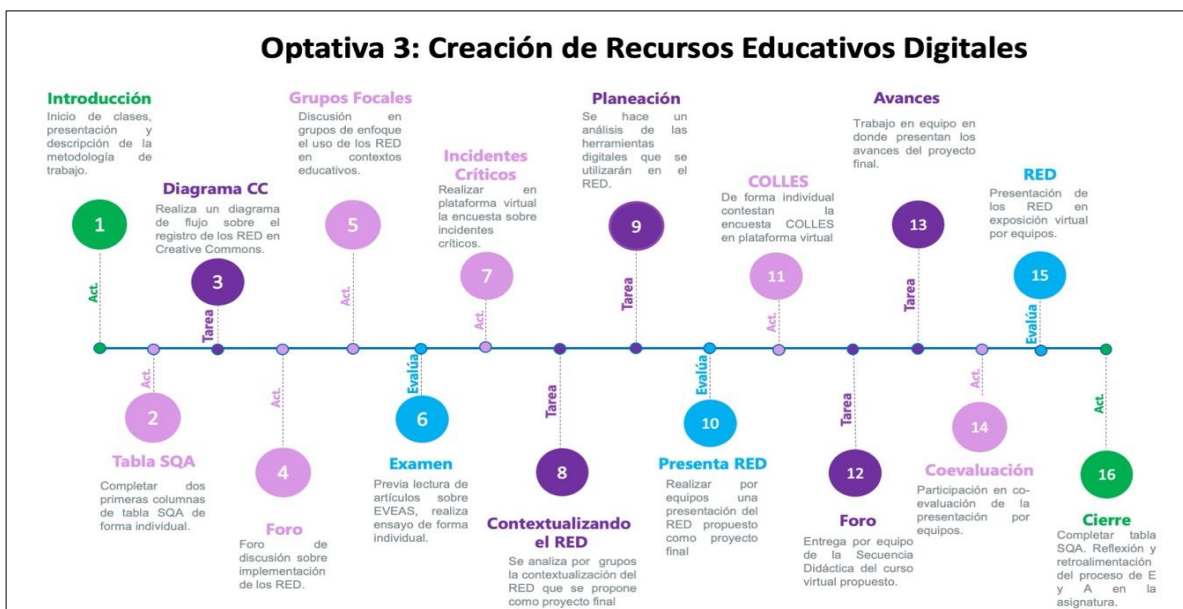
Fuente: Elaboración propia con base en Castañeda (2019)

Figura 6. Secuencia de actividades desarrolladas en la materia optativa “Evea y plataformas educativas”



Fuente: Elaboración propia con base en Castañeda (2019)

Figura 7. Secuencia de actividades desarrolladas en la materia optativa “Creación de recursos educativos digitales”



Fuente: Elaboración propia con base en Castañeda (2019)

The three optional subjects had different scenarios in which the different digital skills were worked on. These teaching-learning environments were determined by the planned activities, as well as by the technological infrastructure that was available at that time in the Faculty of Psychology of the UASLP for academic use, namely:

- Traditional classroom: classroom in the building where the different subjects corresponding to the degree in Psychopedagogy are taught. They are equipped with blackboard, projector, speakers and internet connection.
- ICT room: room in the administrative building used for videoconferences. It has computers for students, internet connection, specialized equipment for videoconferences, smart board and projector.
- DidacTIC: institutional virtual platform based on Moodle to teach classes corresponding to the different degrees at the UASLP. The space is requested from the Academic Secretary of the university and is activated with the students enrolled in the subject.
- Microsoft Teams: free virtual platform for academic and administrative use by members of the UASLP community. Through mail and the institutional user, a space is generated on the platform where the course of the subjects is designed.
- Videoconferences: to maintain communication, synchronous sessions were held supported by three digital tools: Skype, Zoom and Teams. The selection of them was determined by the stability of the connection and the ease to carry out the planned activities.

The spaces described above were used at different times in each of the optional subjects. Table 3 below shows the use of the infrastructure and digital tools present in the optional subjects.

Tabla 3. Ambientes y escenarios presentes en las materias optativas

Materia	Aula tradicional	Aula TIC	Didactic	Teams	VCF*
Las TIC en la educación	X	X	X	-	-
Evea y plataformas educativas	X	X	X	-	X
Creación de recursos educativos digitales	X	-	X	X	X

Nota: *Videoconferencias

Fuente: Elaboración propia

Results

The evaluation process in the optional subjects presented a new way of interacting in the teaching-learning processes, especially in the students as active participants and assuming the role of manager of their own learning, something that is difficult in formal education but that It can be achieved with the disposition and sense of responsibility of those who intervene in said process, that is, from the one who teaches to the one who learns.

It is important to point out that in each of the optional subjects a project was carried out according to what was proposed in the thematic content and responding to the proposed CDD. Of course, it served to evaluate learning and teaching: the students demonstrated by doing and not only what they thought they knew or what they said they knew was assumed; this is important when assessing competencies in the subjects and it can be said that it is one of the most authentic strategies in this regard, because it collects all the information, activities and content in a single project.

In elective one, the final project was a video on an educational topic that was inserted into a blog made by teams. In elective two, the project addressed an educational theme in an LMS platform selected by teams, where students worked from planning to the didactic sequence, selection of REDAs and implementation. Finally, in elective three, the students, as a final project, made a digital educational resource, and a virtual exhibition of each of them was held, to which all the teachers and students of the degree in Psychopedagogy and the Faculty of Psychology of the UASLP.

Implementing the subjects with this type of activities and evaluations throughout the process was interesting and complex, since many external factors had to be considered, for example, the digital infrastructure in the career in question and individually with the students, the time, the willingness and workload of both the students to carry out the activities and the teacher to evaluate them.

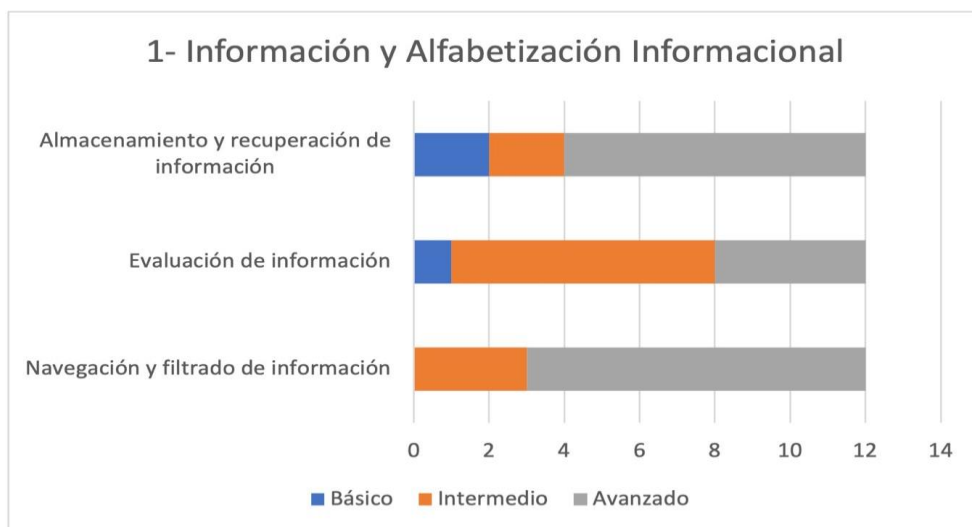
The subjects were made up of different participants, since, as they were offered as electives, heterogeneous groups were created. For the same reason, it was complex to evaluate the three electives as a whole. As a result of the events, the group of students who took the three subjects was identified, and an analysis of the three groups resulted in a total of 12 students who participated in all three.

Based on the ideas presented, it was important to evaluate the digital competence developed by the students who had the opportunity to participate in the three optional subjects and analyze each of the areas referred to in them, for this reason a questionnaire was applied in Google Forms to analyze the self-perception of the development of CDD only to these 12 students mentioned above.

The questionnaire was divided into the five areas indicated by Intef (2017), with their respective dimensions. In total, 21 items designed to identify the level of CDD. The questionnaire was adapted to the context of the research and for this reason a further section was added to know the opinion of the students on the development of the three subjects, in order to know their level of satisfaction on the way of teaching the classes by the teacher, the selection of the content in each of them and identify the usefulness of these in the different scenarios with which they interacted in their FID. In addition, at the end an open opinion question was asked to obtain feedback on the strategy in general. In this way, the following results were obtained:

Information and information literacy. Taking into account the development of the competences indicated by the Intef (2017), corresponding to identifying, locating, obtaining, storing, organizing and analyzing digital information, data and digital content, evaluating its purpose and relevance for teaching tasks, it highlights that the Most of the 12 participants remain at an intermediate and advanced level, as shown in Figure 8.

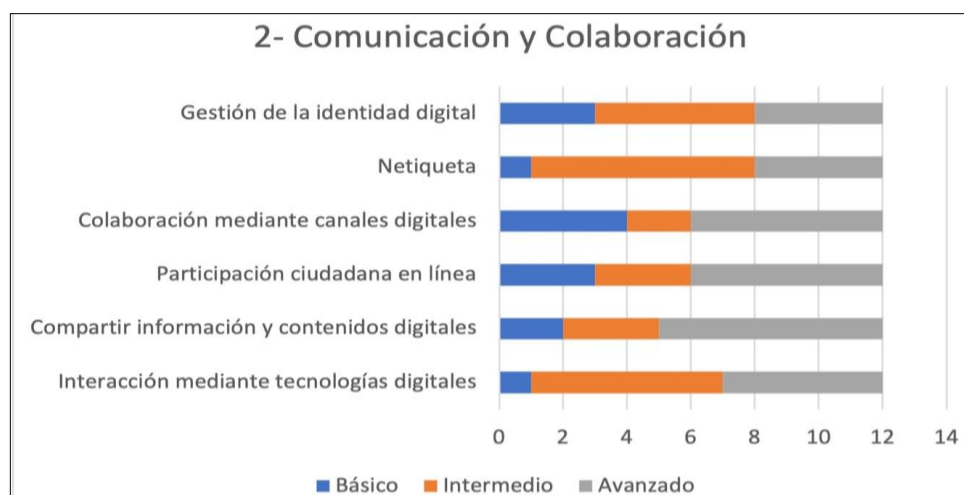
Figura 8. Percepción de la CDD en el área 1) Información y alfabetización informacional



Fuente: Elaboración propia

Communication and collaboration. In the case of the results that are related to communication carried out in digital environments specified by Intef (2017), and that are related to sharing resources through online tools, connecting and collaborating with others through online tools. digital, interact and participate in communities and networks, it is observed, we said, that the majority of the 12 participants remain at the intermediate and advanced levels, as can be seen in Figure 9.

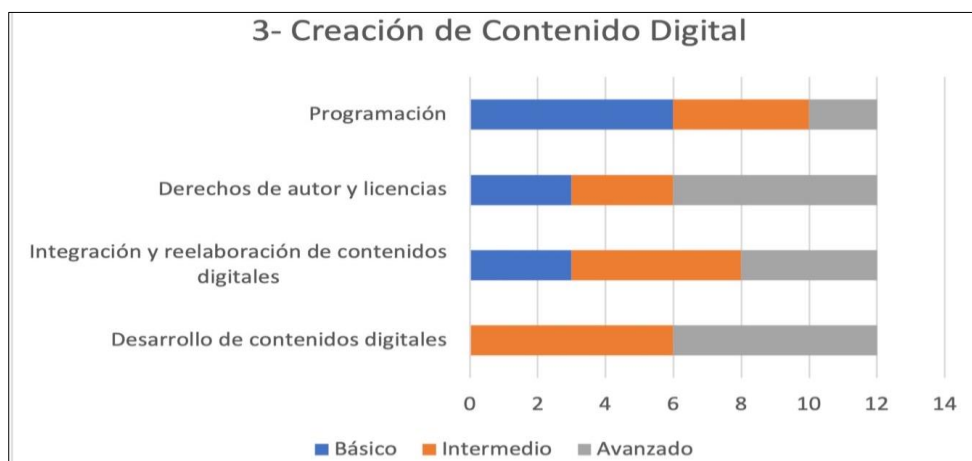
Figura 9. Percepción de la CDD en el Área 2- Comunicación y colaboración.



Fuente: Elaboración propia

Creation of digital content. When analyzing this area described by Intef (2017), which covers the creation and editing of digital content, integration and reworking of previous knowledge and content, production of artistic productions, multimedia content and computer programming, knowing how to apply intellectual property rights and the use licenses, the information shows that the majority of the 12 participants perform at the intermediate and advanced levels. It should be noted that, in the programming section, six of the participants have the self-perception that they only know the basic concepts and fundamentals of computing and mobile technology in education, so they positioned themselves at a basic level. This is shown in Figure 10.

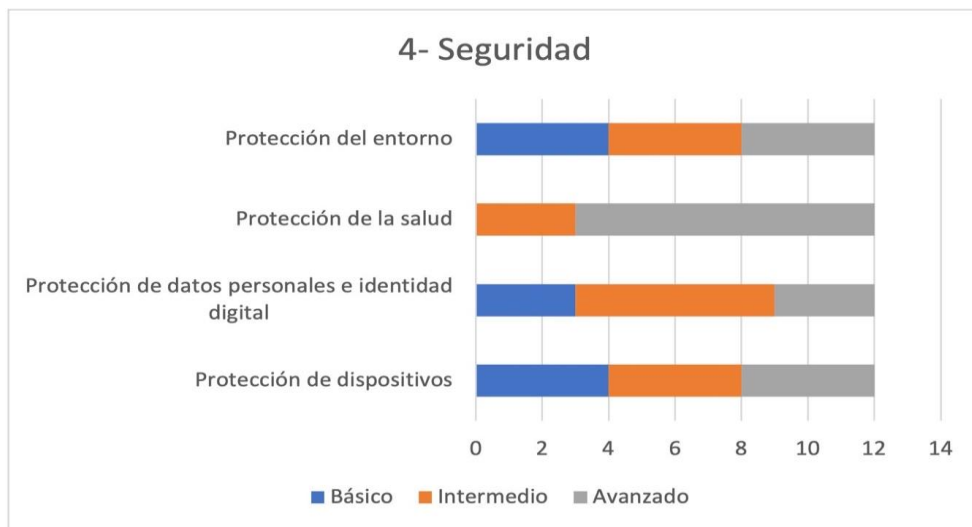
Figura 10. Percepción de la CDD en el área 3) Creación de contenido digital



Fuente: Elaboración propia

Security. In this section, the Intef (2017) focuses on the protection of information and personal data, protection of digital identity, protection of digital content, security measures and responsible and safe use of technology. The majority of the participants are positioned at the intermediate and advanced level in these digital skills. It is noteworthy that on the subject of digital skills that include health protection, all of them consider that they know how to protect themselves and others from cyberbullying and understand the health risks associated with the use of technologies (from ergonomic aspects to technology addiction), when positioned at the intermediate and advanced level, as shown in the following figure 11.

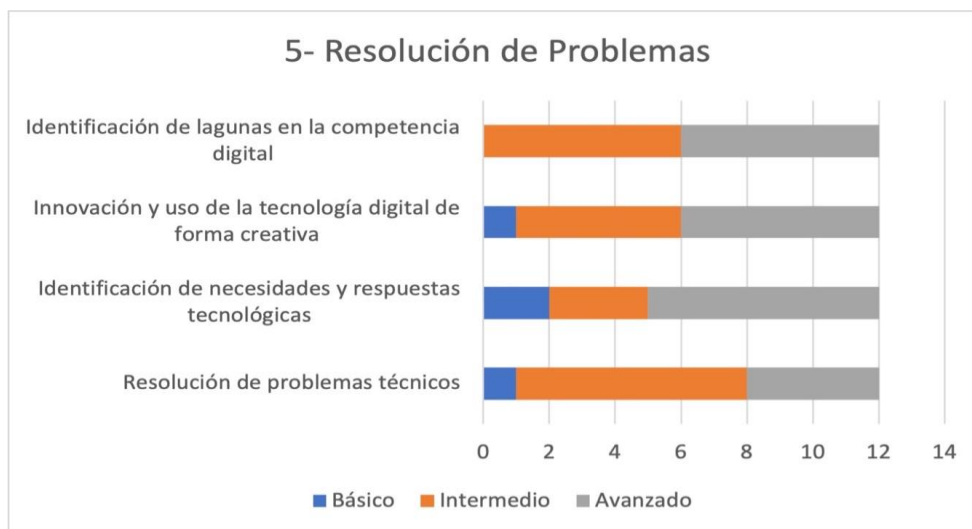
Figura 11. Percepción de la CDD en el área 4) Seguridad



Fuente: Elaboración propia

Problem resolution. The classification made by Intef (2017) includes identifying needs for the use of digital resources, making informed decisions about the most appropriate digital tools according to the purpose or need, solving conceptual problems through digital means, using technologies creatively, solve technical problems, update your own competence and that of others; here the participants are recognized at an intermediate and advanced level. In addition, they consider that they search, explore and experiment with emerging digital technologies that help them to keep up to date and fill possible gaps in the digital competence necessary for their teaching and professional development, and not only that, but they also organize their own updating system. and learning, make methodological changes and adaptations for the continuous improvement of the educational use of digital media, which they share with their educational community, supporting others in the development of their digital competence. The above can be identified by looking at Figure 12: all the answers regarding this point are at the intermediate and advanced level.

Figura 12. Percepción de la CDD en el área 5) Resolución de problemas

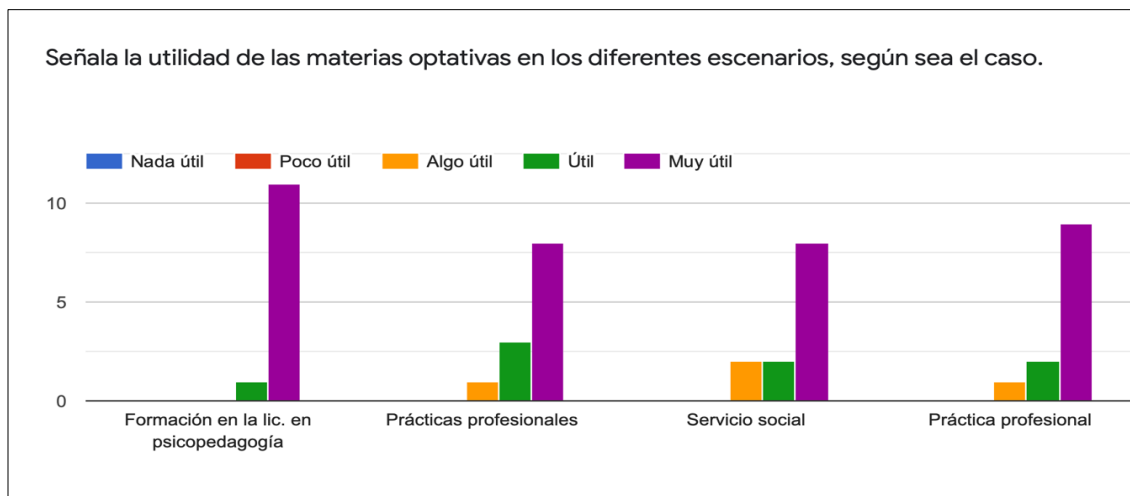


Fuente: Elaboración propia

At this point, it should be clarified that of the 12 participants that make up this group, two had the status of intern in the degree in Psychopedagogy and two more as professionals; the remaining eight were still as students at the faculty. In the applied questionnaire, a brief description of the job they perform is requested and the two graduates mentioned that they develop as "Educational support in virtual classes".

Next, we consider it pertinent to expose the results obtained on the importance and usefulness of the three optional subjects that develop digital competences in the students of the degree in Psychopedagogy of the UASLP, and that allow a better development and participation in the different scenarios of all their studies. training process and in their future professional practice. Thus, it is important to highlight that, according to the data obtained, there is an identification by all the participants in the usefulness of these subjects as part of their initial training (figure 13).

Figura 13. Utilidad percibida de las tres materias optativas en los diferentes escenarios formativos de la licenciatura en Psicopedagogía de la UASLP

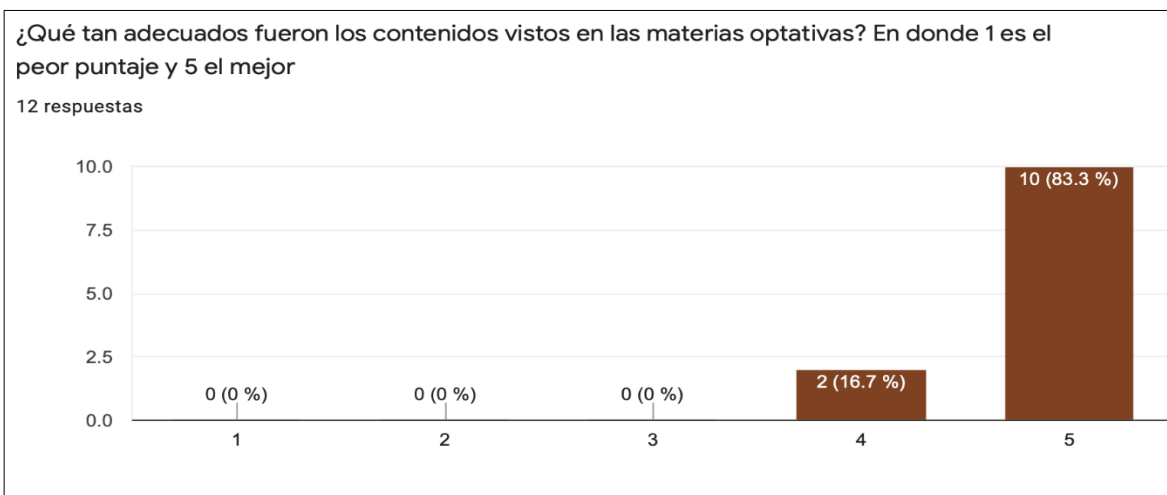


Fuente: Elaboración propia

Regarding the development and implementation of the three optional subjects, we also sought to obtain a response from the group of 12 students. The perception of the relevance of the contents, the way of teaching the classes and the selection of the activities and evaluation methods were examined, all on a Likert scale, where one was the worst rating and five the best. In summary, given the results obtained, we can affirm that the development and implementation of the strategy was positive and quite encouraging.

In the "Relevance of the contents" part, two students indicated with a score of 4 and 10 with a score of 5. It is worth mentioning that the two students expressed in the survey that they would have liked more to be addressed on the subject of gamification. , purpose-built digital tools for video editing and game programming. The results can be seen in the following figure 14.

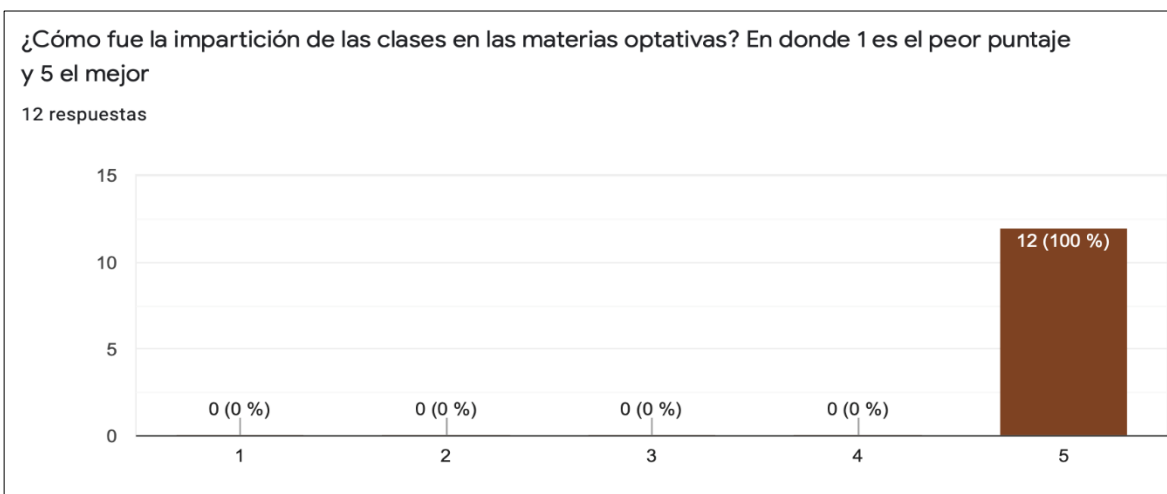
Figura 14. Pertinencia de los contenidos en las tres materias optativas



Fuente: Elaboración propia

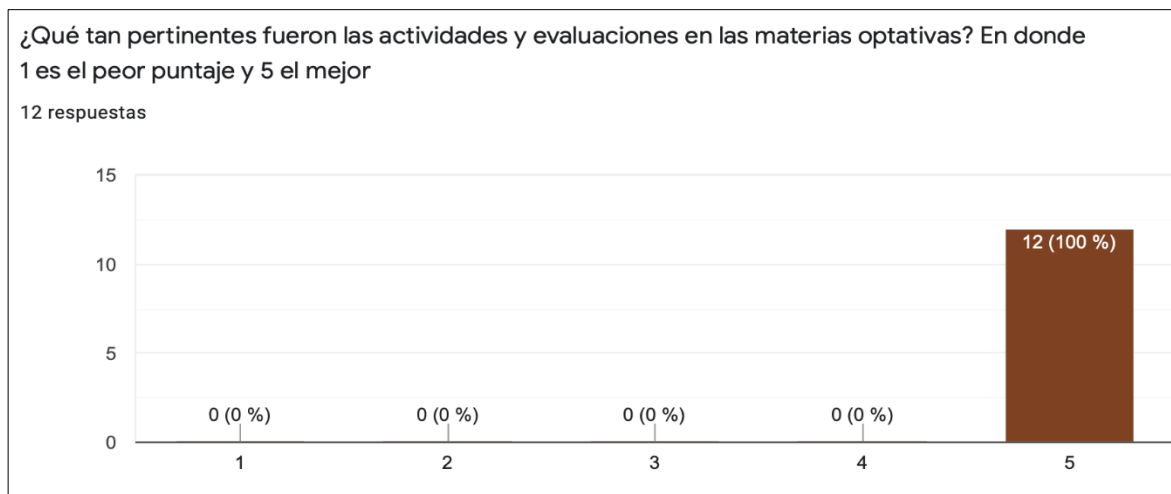
In the investigation of the way of teaching the subjects, the activities and evaluation methods, it can be concluded that the participants consider that the development was very pertinent, as shown in figures 15 and 16.

Figura 15. Impartición de las clases en las tres materias optativas



Fuente: Elaboración propia

Figura 16. Pertinencia de las actividades y métodos de evaluación en el desarrollo de las tres materias optativas



Fuente: Elaboración propia

At this point it is necessary to recognize that, as Martínez (2012) mentions, following the basic idea that defines the proposal, an evaluation has been carried out in accordance with decision-making and identifying the crucial and fundamental aspects and dimensions of the three subjects. electives that represent the strategy for the development of CDD in the LPP. Thus, through the observation and analysis of value judgments, a hierarchy and weighting of the actions that were taken were made, which resulted in a useful evaluation to make decisions in the proposal and leaves an open door to implement. this strategy in other higher education institutions focused on IDF that includes a contextual adaptation.

Discussion

Implementing the subjects from the authentic assessment approach and carrying out a set of activities that allowed the student to reflect on the learning process required a conscientious analysis of each activity by the teacher. All this allowed a change in the teaching-learning process, but, in turn, represented hard work, a high commitment and investment of time. Perhaps that is why some authors state:

The innovations that have been intended to be introduced in formal education with respect to the evaluation process have not been fully assumed by teachers, and have only generated specific improvements that probably do not

manage to configure a renewed teaching-learning process. (Ahumada, 2005, p. 55).

Ahumada (2005) refers that students tend to strongly reject the traditional forms of work that are followed in the classroom because they are contrary to the culture spread by the media at this time. That is why the authentic evaluation was a great support for the achievement of the objectives, since it allowed the connection between the proposed activities with the activities carried out by the students in other subjects.

Authors such as Tobón (2017) propose a change in educational institutions towards a knowledge society, although this requires changes ranging from management, planning, and implementation methodologies to the development of a culture of continuous improvement through evaluation. .

In accordance with the above, it is considered that teacher training institutions need to maintain a consistent vision to migrate to the knowledge society, especially in the implementation of digital technological applications that will allow the collaborative work of all the participants in the teaching process. teaching-learning. It is not about complying only with the instrumental requirement, as a distinctive characteristic of educational centers, but as an essential part to promote sustainable social development, where a better quality of life is reflected for society and the community that has deposited the trust in them.

Conclusions

ICTs have penetrated all spheres of people and have permeated so much that they have configured new scenarios; they have transformed the way of thinking, acting, working, relating, having fun and, of course, learning and knowing; That is why we say that: ICTs are the central core of organization in today's society. For this reason, the school must give meaning to the world that surrounds the student, to be able to interact with him and face the problems that he presents. One more reason why ICT should be present in training processes, there is no doubt about that.

The new educational scenarios where the ubiquitous character of digital technology is present, where we see classrooms and educational centers increasingly equipped with digital devices and where there are more and more pedagogical and didactic projects that try

to take advantage of the benefits that educational technology offers, they require teachers prepared to make use of these tools.

Higher education institutions, especially those in charge of FID, have a commitment to their students to create learning spaces in accordance with the time and space in which they live, that is, they must evolve and transform according to the context. And part of this is updating their curricula, teacher training, and infrastructure adaptation. Without a doubt, it is complicated to carry out these tasks, but short, medium and long-term planning is needed.

The proposal and implementation of the strategy for the development of digital skills in the higher education institution as part of the planning and updating of the study plan made it possible to connect what was taught to students in the three optional subjects and that exists in the real world. The design of each subject based on authentic evaluation allowed the topics addressed and the activities carried out to be developed according to the purpose that was planned. Although it is true that hard work is required from all the participants, it was carried out with a high level of commitment, especially by the students who identified the necessary elements to take them to their future teaching practice or to develop their own activities. Of their training process such as professional internships and projects in a transversal way in the institution.

Future lines of research

From the research carried out, some lines of research emerge: evaluation seen as a process of reflection from the student, where it is not only thought of as a method for obtaining a passing grade. For this, it is also necessary to make changes from the proposal of plans and programs that promote different evaluation methods and the use of a variety of instruments and forms that show the development of students, without weighting depending on it.

In addition to the above, it is necessary to search for methodologies for management, planning, implementation and evaluation of subjects that develop digital skills in higher education institutions in charge of FID in Mexico, which enable the development of a comprehensive training model in relationship with the ICT of future teachers and thus be able to glimpse a common framework of digital teaching competence in Mexico.

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