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Integration Of Ict In Training Scenarios Under The Flipped Learning Approach

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ABSTRACT

The use of technology as a support to the educational process has been very present nowadays, and even more so during the pandemic situation of Covid-19. However, in this integration of ICT into the educational context, the development of a traditionalist methodology is still evident, and it is there where this research is presented to reveal the pedagogical practice supported with ICT under the pedagogical approach of inverted learning used by teachers of a higher education institute in Colombia. The study is framed within the interpretative paradigm and the descriptive qualitative approach. Ethnomethodology was used to approach the reality experienced by 25 teachers. For the analysis of the data from the in-depth interviews applied, grounded theory was used, which favored the deconstruction, structuring and contrast of the information collected, in addition to its subsequent interpretation and reconstruction of reality through a central category (pedagogical approach) and emerging categories (pedagogical practice and ICT integration into the educational process). From the findings obtained, it is concluded that teachers do not apply a constructivist approach in their pedagogical practice, even when they use virtual platforms to accompany the educational process. A passive, memoiristic and repetitive learning environment prevails. A training scenario based on inverted learning is required to create a more active, dynamic and participative learning environment conducive to successful learning.

Keywords: ICT, ICT integration, Inverted Learning Approach.

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INTRODUCTION

Information and Communication Technologies (hereinafter ICT) have been very present in recent years in the educational context, further strengthened by the Covid-19 pandemic. This phenomenon evidenced the importance and relevance of ICT in the pedagogical act, through active learning methodologies (Ortíz-Arismendy et al., 2019). The integration of ICT into educational scenarios has been an issue that has concerned governments, educational authorities, educational institutions and teachers (Adoumieh, 2021; Rodríguez, 2018), leading to its incorporation being considered essential within the curricula (Fernández et al., 2020; Ramírez-Rueda et al., 2021; Valtonen et al., 2018), to the point that international organizations such as UNESCO have designed programs to support countries in the integration of ICT into the educational context.

ICT have become a transversal axis for the academic training of students. This integration has a triple action: 1) ICTs serve as an instrument that facilitates teaching and learning processes, as didactic resources and as a source of information/communication between the actors in the educational act, 2) ICTs are tools for information processing, and 3) ICTs facilitate the development and dissemination of contents implicit in learning.

Likewise, the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2019) in a published document that advocates ICT competencies of teachers, indicates that teachers should adopt ICT to improve teaching methods and favor the learning process, which is only possible from alternative pedagogies centered on the student such as the problem-based approach or collaborative and cooperative projects. This is well expressed by Benito and Cruz (2005) when they point out that "the integration of ICTs in the academic field can facilitate many of the tasks aimed at fostering critical and collaborative thinking, self-learning and lifelong learning" (p. 3).

For more than a decade, educational institutions in Colombia have been incorporating the use of ICT in education (Hernández et al., 2019). In response to this interest, the Ten-Year Education Plan 2006-2016 was enacted, in addition to the current Ten-Year Education Plan 2016-2026, which again incorporates the topic of technologies together with science and innovation as it is a challenge that requires much more efforts from public and private actors (Comisión Gestora, 2017). Likewise, the Ministry of National Education (Mineducación, 2019) has promoted the development of programs to encourage scientific research supported by ICTs for education. On this matter, Melo (2018) expresses that it is intended for "the development of research that contributes to the design of didactic strategies, flexible methodologies and innovative pedagogical models that guarantee their students regardless of their area (rural or urban) or other particular conditions, the participation of a quality education" (p. 4).

Within the framework of these approaches, the Instituto Superior de Educación Rural (ISER) of Pamplona (Colombia), an institution whose mission is to train comprehensive, competent professionals committed to rural and urban development through technological careers (in the fields of agriculture and livestock, agro-industry, management and construction of civil works, socio-entrepreneurial development, network management and teleinformatics systems, among others), has been working in the classroom mode with virtual support, The ISER has been working in the face-to-face modality with support in virtuality, but striving for a change in the pedagogical model to a student-centered one.

Teaching practices are observed that fit within the traditional education model, characterized by the use of didactic resources such as PDF guides, electronic presentations that are not very interactive and the use of the blackboard, where the student just reads and answers what the teacher indicates. This traditionalist model is lived and was lived during the pandemic even when technological tools were being used as a means of communication and interaction (Prada et al., 2022).

As a consequence of the above and to change that traditionalist conception to a constructivist model, the initiative of the present research and the purpose of the same referred to improve the pedagogical praxis supported with technology under a pedagogical approach called Flipped Learning Model (FLM), spread in 2012 by Aaron Sams and John Bergmann, which refers to a model that reverses the roles of the actors involved in training (Gianoni-Capenakas et al., 2018; Brewer & Movahedazarhouligh, 2018; Andujar et al., 2020; Hernández-Suárez et al., 2020).

The Flipped Learning Network (FLN, (2014) is defined as:

> [...] a pedagogical approach in which direct instruction is shifted from the group learning dimension to the individual learning dimension, transforming the remaining group space into a dynamic and interactive learning environment in which the facilitator guides students in the application of concepts and in their creative engagement with the course content (p. 1).

Following this definition, ISER is in search of innovative changes in the models and pedagogical practices to seek quality in academic training that leads to meaningful learning, and this implies implementing new training actions through strategies and methodologies that favor the teaching process for more active, participatory and dialogical learning. Hence, the objective of this research is to unveil the pedagogical practice supported by ICT under the pedagogical approach of inverted learning used by teachers.

ICT in the educational context and flipped learning: A review of the literature

The introduction of ICT as a technological tool in the educational context makes it possible to improve various processes (pedagogical, organizational, didactic, evaluative, and curricular, among others). In the field of teaching, ICT has a particular potential because it can support several fundamental tasks and activities such as curriculum planning, development of classroom strategies, systematization of relevant information related to learning, teaching innovation, and teacher-student communication processes, among others (Sabirí, 2020; Lawrence & Tar, 2018; Nikolopoulou, 2020).

Some research refers to this type of benefits of ICTs adopted in the field of education. Villegas et al. (2017) point out that ICTs have an impact on the change of the educational model from one focused on teaching to one focused on learning, in addition to promoting digital competencies that make students autonomous in the management of their learning. Likewise, Lerma et al. (2020) state that "using technological tools helps students to advance at their own pace in academics and develop metacognitive skills that allow them to reflect on the importance of making proper use of them" (p.27).

The incorporation of ICT in education has become a process that not only depends on the use of technology (Contreras-Colmenares & Jiménez-Villamarín, 2020). In addition, it must be

accompanied by adequate, relevant and coherent pedagogical practices. Díaz-Barriga (2013) states the following on the matter:

> The incorporation of information and communication technologies (ICT) in the classroom is a process that is increasing rapidly worldwide, it is a global expression of education. In this situation, it is necessary to keep in mind that its incorporation is not limited to the problem of having the tools that make up these technologies: hardware and software, but the most important thing is to build an educational and, strictly speaking, didactic use of them (p.5).

In this sense, the teacher's technological-pedagogical skills are a requirement when using ICT in the classroom to improve teaching and learning processes. A proposal of a pedagogical nature that enables a transformation within teaching practices is inverted learning. The term inverted learning refers to a pedagogical approach where the instructions of the training process are carried out outside the classroom, taking advantage of face-to-face time for the development of activities that lead to meaningful learning. Aycart (2019) explains the use of this approach, allows the student to be more active during the teaching and learning process, who investigates, analyzes, consults and demonstrates his progress, with the benefit of the accompaniment of his or her guide who is the teacher.

In that order of ideas, there is a similarity of concepts concerning the flipped classroom and flipped learning, although both have different objectives. Asens (2015) states that, in the flipped classroom, "emphasis is placed on assigning students texts, videos or additional content to review outside of class and the time in the classroom does not necessarily imply a methodological change" (p.17). On the other hand, flipped learning does imply a change in methodology, since it has a deeper reach in learning, meaningful, real and student-centered learning.

The Flipped Learning Network (FLN, 2014) indicates that for flipped learning to be considered as the pedagogical approach used in a classroom, the following elements must be present: 1) flexible (F), students choose where and when they learn, making learning by teachers more flexible; 2) learning culture (L), which changes the roles of the actors in the educational process, with the student being responsible for his own learning and the teacher his guide; 3) intentional content (I), with which the teacher evaluates what content needs to be explained directly through the lessons and what material the students should explore outside the classroom in order to take advantage of the time in the classroom and be able to help students learn the necessary competencies (concepts, procedures, skills, attitudes and values) through this approach, skills, attitudes and values), 4) professional teacher (P), who is an important and key actor for the success of the implementation of this inverted approach, without forgetting that the main protagonist of the educational process is the student, through 5) progressive activities (P), 6) attractive experiences (E) and through 7) diverse platforms (D). The above corresponds to the 7 fundamental pillars, which derive from its acronym F-L-I-P-P-E-D (Flexible environment, Learning Culture, Intentional Content, Professional Educator, Progressive activities, Engaging experiences and Diversified platforms) (Prada, et al., 2021).

At least two developmental theories can be the basis for learning: constructivism and meaningful learning. Constructivism is an epistemological current that maintains that knowledge is constructed based on lived experiences, the influence of the social and cultural environment in which the individual develops, as well as his or her motivations and aspirations. Serrano and Pons-Parra (2011)

point out that constructivism "states that knowledge is not the result of a mere copy of the pre-existing reality, but of a dynamic and interactive process through which external information is interpreted and reinterpreted by the mind" (p.11).

In this sense, learning and knowledge are generated from the interaction of the educational actors, since they share previous knowledge, contents, experiences and continuous feedback focused on the construction (individual or collective) of knowledge, this being a relevant aspect for the inverted learning approach. Likewise, this pedagogical current contemplates the change of roles of the teacher and the student. The latter becomes the main protagonist of the teaching and learning process, who acquires an active behavior in the acquisition of his or her knowledge since constructivism allows enhancing students' abilities to learn to think, to be, to know and to do.

Ausubel's theory of meaningful learning is based on constructivism and is presented as a cognitive process and is manifested when between the interactions of peers, previous knowledge and new ideas, mental structures are expanded and enriched to generate new ideas or knowledge. Bazo (2017) expresses that meaningful learning occurs when the student relates new learning from previous ideas, or conditions new knowledge with previous knowledge to compose a new meaning, in such a way that the student can give meaning to what he is learning and relevance to what he is doing. For Ausubel (2002), this learning is characterized by building knowledge harmoniously and coherently, and, therefore, it is learning that is built from solid concepts.

In that order of ideas, Garcés et al. (2018) point out that meaningful learning has certain requirements: 1) from the didactic point of view, this learning has its demands so that the process of fixation and assimilation of knowledge is fulfilled, and 2) use of potentially meaningful material and to the subjective predisposition for learning. Likewise, the aforementioned authors present some advantages, among which the following stand out: 1) the memoiristic process is overcome, since it focuses on linking new information to the cognitive structure, in the sense of storing information to develop short and long-term memory; 2) it constitutes a form of cognitive teaching that interacts directly with the intellectual structures of individuals; 3) it is related to motivation to help the appropriation of knowledge; 4) it is an active and personal teaching process, provided that the student takes advantage of learning activities and tasks; 5) they are circumscribed in the four pillars of education: learning to know, learning to do, learning to live together and learning to be.

METHOD

The research was framed within the interpretative-hermeneutic paradigm and the descriptive qualitative approach. Ethnomethodology was used for the development of the study based on the inductive reasoning method. The qualitative approach is because this heuristic proposal is ideal to understand with breadth and depth the reality of the problems studied and the phenomena observed in the environment of the educational context. Cuenya & Ruetti (2010) state that qualitative analysis "seeks to understand the phenomena within their usual context, it is based on detailed descriptions of situations, events, people, interactions, observed behaviors, documents, and other sources that aim to pretend not to generalize the results" (p.16).

With the use of ethnomethodology, the aim was to understand in depth the active part played by the actors in the educational process as a social group. Rodriguez et al. (2002) point out that this method

"attempts to study the social phenomena incorporated into discourses and actions through the analysis of human activities" (p.15). From there, the method made it possible to specify the pedagogical approach used by teachers during academic training even when they use ICTs to support the educational process, as well as to reveal the sense and meaning of integrating ICTs into their pedagogical practices.

The research was carried out at ISER. Twenty-five teachers from the Agroindustrial Processes Technology program participated in the study, who have more than five years of teaching experience and were identified as D1, D2, D3, D4, D5, [...]. For data collection, the in-depth interview was used through a script of questions, and the data analysis was done from the methodological rules proposed in the Grounded Theory (Strauss and Corbin, 2002) and with the support of Atlas.ti. software, to generate semantic networks that favored the structuring, contrasting and theorization of the substantive reality studied (Martínez, 2017).

RESULTS

From the analysis developed to the contributions and opinions given by the key informant teachers regarding the pedagogical approaches used during the pedagogical practice, a central category called Pedagogical Approach was obtained, emerging from it, two selective categories such as Pedagogical Practice and ICT Integration in the educational process. These findings are detailed below.

First selective category: Pedagogical practice

The pedagogical practice focuses on teaching, learning, evaluation and didactic application. On the other hand, within the pedagogical practice, information and communication technologies can contribute to the empowerment of learning by students and their access to new knowledge, and on the other hand, they could strengthen relationships with teachers, as the latter see the authority granted by the absolute dominion of knowledge in the classroom diminish. From this perspective, Figure 1 shows the subcategories or axial categories that emerged from the practice: content planning, guided didactic resources and passive didactic strategies.

This structure of information analysis gathered three fundamental elements to understand the reality under study, since it was there where most contributions were found during the treatment of the data provided by the subjects, in that sense, they show the greater meaning that they attribute to their pedagogical work during their work activity.

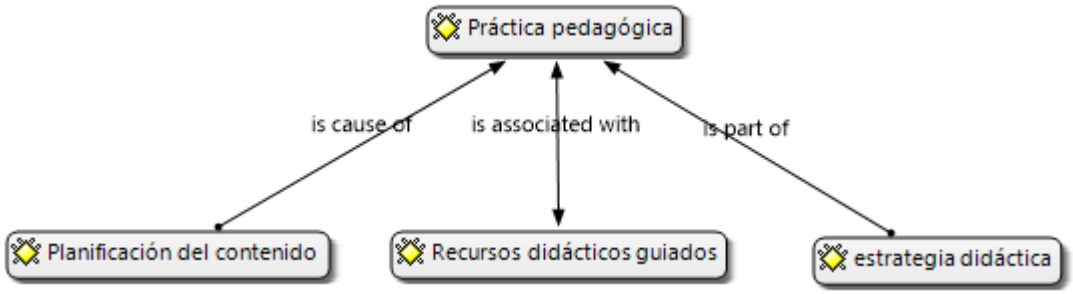

FIGURE 1

SEMANTIC NETWORK PEDAGOGICAL PRACTICE

Content planning

Planning the content is one of the elements used in pedagogical practices, which refers to the importance of teaching with the content in mind and not so much in the student's learning, that is, it is traditional teaching centered on the teacher. Here the teacher maintains a behaviorist methodology by planning activities based on instructional objectives.

This appreciation is confirmed in the opinions given by each of the informants. For example, D1 stated "[...] I plan according to the contents, I try to carry out activities in the classroom that are related to the material I teach them as guides or explain them in class, and that is what he evaluated", and D12 stated, "I do not like to improvise, therefore, I like to plan according to the objectives and contents, I like to guide them, ask them questions in class about the topic being discussed". The same appreciation is revealed in D24: "I believe that the best way to teach our students is through trial and error, all the activities I plan are done thinking about how to teach certain content and that the students can understand me".

These points ratify the planning and subsequent teaching by content that teachers follow in their pedagogical practice, being the one who takes control of it and where a concern for the fulfillment of the content rather than for the achievement of student learning is evident. In fact, through content planning (video microclass), the process of inquiry is completed before the class, but they are still stuck in planning the process of practicing flipped classroom or understanding the flip as the inversion of Bloom's cognitive objectives, which cannot help to distinguish the effectiveness of various modes of flipping (flip) and it is found that the pedagogical practice although the flipped classroom model is being applied is still a traditional model of teaching structure sequence.

In this way, the current task is to preview the content of the next class, students have plenty of time and there is more time for discussion after class, which little appreciates the students' autonomous learning ability.

Guided learning resources

Didactic resources are all those materials used by the teacher to facilitate the teaching and learning process. From the informants' contributions, it was possible to evidence the use of guided didactic resources such as materials or learning guides supported by copies of contents, questions, memorized and repetitive exercises; the use of printed books and, sometimes, the integration of ICT resources such as video. Video technology in pedagogical practices under a flipped classroom approach is very enthusiastic. Video has become a key element of this approach and seems to have become an important symbol. Indeed, video is only one characteristic technology used for knowledge transfer in the flipped classroom, but it is not the only technology, and it is not necessarily the best technology. Video learning is a passively accepted method of learning. It lacks interaction. In this regard key informants stated the following:

D4 explains the following throughout the interview: “I use ICT for the development of resources, especially the theoretical and practical guides. I structure it very methodically, do I understand, I put the objective of the resource, the steps to follow in case it is an activity type resource and of course the theory I want to teach”; D13 stated that “I am very practical, I like the use of videos, I send them to watch a certain video, and I develop a series of questions for them to answer, other times I elaborate a guide and send them to read it, in class we discuss it. When we were one hundred percent virtual, I used links for them to review, and of course the videos”; and D15 expressed “I generally use books or guides as a resource, I do reading in the classroom, and I carry out activities in the classroom guided by me concerning the resource I use at that moment”.

This indicates that the use of resources guided by the teacher leads to a traditional pedagogical practice with programmed teaching, where spaces for critical and argued discussion and reflection of students are rarely provided. In fact, according to the theory of the zone of proximal development, the need for new knowledge will arise when high-level thinking is based on existing knowledge, and this learning is from high-level learning objectives to low-level learning objectives. Therefore, these resources have a good effect on the transmission of declarative knowledge, but it is difficult to train advanced thinking.

Teaching strategies

Teaching strategies are those structured procedures and activities that the teacher uses to promote learning. Generally referring to the use of methods, instructions and techniques by teachers to provide didactic materials, the strategies used in teaching are usually a combination of multiple procedures or techniques. Thus, it is a continuous system constructed by direct teacher-based teaching and indirect student-based teaching that leads to the improvement of teaching effectiveness and learning achievement. In this sense, the information given by the teachers who were the subjects of the research evidenced that, in their pedagogical practice, they implement didactic strategies that are subordinated to planning whose purpose is to comply with the development of curricular contents more than the students have already received direct teaching with the help of technologies according to the specific situation of individual learning before the class.

From this perspective, the opinions of D22 are taken up again, when she expressed “as a strategy I am usually very masterful, I explain the topic or content and then I start asking questions”. Likewise, D17 said “I consider myself very traditional both in the face-to-face and virtual because I like to explain my class and based on that I apply strategies to develop individual and sometimes group activities”. D19 said “I teach my classes according to what I have prepared, and I like to do group work, I give them the indications and the topic to develop”.

Based on the opinions generated by the key informants, it is evident the application of passive didactic strategies through instructional objectives, developing, for the most part, work and individual class activities, actions that are linked to the traditional method, where the participation of students is clearly reduced in the realization of activities proposed by this, which necessarily does not favor learning, but rather repetition, memorization and the scarce possibility of interaction between students, teachers and the content treated since in the process of promoting personalized learning of students, it is also found that the teacher's thinking needs to be invested more in the inverted classroom.

Second selective category: Integration of ICTs into the educational process

The integration of ICT into the educational process has been very latent in the last two years due to the COVID-19 pandemic, as it managed to influence the development of the traditional face-to-face pedagogical practice to move to dynamic and interactive scenarios in remote or virtual contexts as a result of the global health emergency that limited the face-to-face educational process. In this context, the information provided by the teachers - informants, confirms that they were able to integrate - use technological tools as an accompaniment to the academic training they provide to their students, a situation that, from the analysis of the information provided by these subjects, was structured in

Figure 2, where the axial categories that emerged from the investigated reality can be seen.

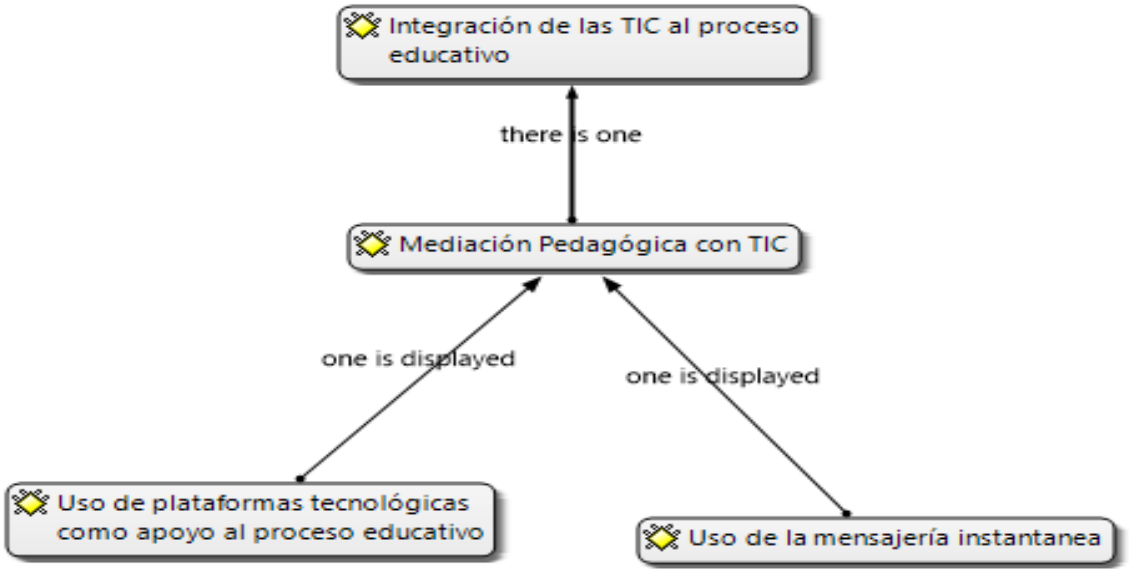

FIGURE 2

SEMANTIC NETWORK INTEGRATION OF ICT IN THE EDUCATIONAL PROCESS

Pedagogical Mediation with ICT

According to Bazó (2017), pedagogical mediation is defined as

> all mediation capable of promoting and accompanying the learning of our interlocutors, that is, to promote in learners the task of constructing and appropriating the world and themselves, where the teacher must mediate between how their students can grasp, encode and understand the contents supported and mediated by ICTs (p. 42).

Thus, the pedagogical practice that teachers develop from their classroom activities tends to the construction of interactive, dynamic, motivating, facilitating and accompanying work sessions for students to approach and consolidate their teaching and learning process.

In this context, teachers acknowledge that they used ICTs to support the educational process, either through technological platforms or instant messaging. In this regard, the following contributions were made: D11 states "since the pandemic began, he used virtual classrooms to upload files and place homework or forum type activities, but in a very basic way, i.e. I place the resources to the virtual classroom and a homework, but in classes, he used the blackboard and sometimes electronic presentations when they lend the equipment", and D21 states "I do integrate ICT to the educational process, but I confess I use it traditionally, to send a guide, to send some activity or to clarify some doubt", likewise, D3 expresses "I almost do not use ICT, I did it during the pandemic, but it cost me a little".

Such testimonies show the scarce interest, motivation, usefulness and didactic mastery that informants give to the use of ICT as a mediation factor in their pedagogical practice since the information provided by them evidences lack of training, capacity for instrumental management in classroom environments, as well as weaknesses in their integration as resources that diversify mediation in face-to-face, blended and virtual environments, from which activities based on inverted learning can be developed.

Central Category: Pedagogical Approach

This central category gathers a reconstruction of the investigated reality from all the previously analyzed categories (Figure 3). The arguments and interpretations given to it, show that the teachers - informants have been using a traditional pedagogical approach, regardless of whether they have integrated some ICT resources such as technological platforms and the use of video applications, social networks and instant messaging.

This reality is corroborated by the sustained execution of a pedagogical practice based on teaching by content and achievement of curricular objectives, the decontextualization of activities that strengthen the achievement of meaningful learning, and the use of resources and strategies based on activities that do not favor pedagogical mediation (with or without ICT) to propitiate participation scenarios, socialization, construction and application of knowledge as evidence of learning that transcends memorization, repetition and the delivery of answers and solutions to parameterized hypothetical cases that are distant from the student's daily experience.

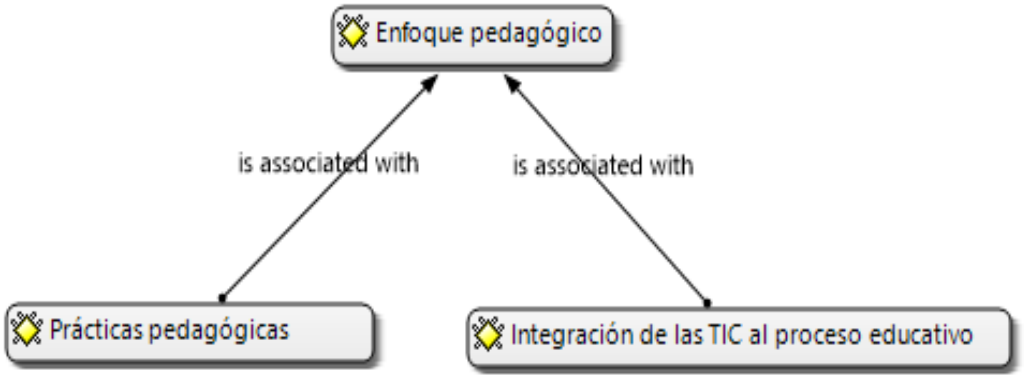

FIGURE 3

SEMANTIC NETWORK PEDAGOGICAL APPROACH

The development of this pedagogical practice has generated a climate of passivity, nonconformity and scarce motivation towards change and optimization of the teaching-learning process executed by the educational actors in the different face-to-face or virtual scenarios. In this sense, it is imperative to promote a learning environment through an inverted pedagogical approach that provides students with the possibility of having more active, dynamic, contextualized participation and interaction mechanisms that promote the development of application experiences of the contents addressed in their class sessions, in such a way that the combination of these situations, the appropriate integration of ICT resources and methodological changes in teaching point towards better work contexts under the inverted learning modality.

In this way, reverse learning is a change based on teachers' reflection on their teaching practice. This is a contagious change from the inside out. Once this learning model changes the mind of one teacher, it means changing the learning model of all the teacher's students, and teachers who have benefited from this learning model are also willing to share this learning model with other teachers. Effectiveness, and even willing to speak up for this learning model. It can be seen that this "flipped learning" is a "grassroots" bottom-up learning model. Furthermore, this learning model has a kind of persistence and as its contagion continues to spread, more and more educators around the world will be willing to adopt this model to transform their own education and teaching.

DISCUSSION

After analyzing the testimonies of each of the key informants, which allowed the emergence of categories to deconstruct, reflect and reconstruct the reality studied, the following points of discussion are emphasized: the implementation of a traditional pedagogical approach persists in the pedagogical practice of teachers during the teaching process they offer to students. The data collected showed: 1) the use of planning focused on content and the achievement of instructional and curricular objectives; 2) the teacher is the central axis of the training process; 3) lectures prevail, in addition to the use of resources and didactic strategies that are not very motivating, with little interaction, participation, construction and application of knowledge. All of the above leads to passive didactic scenarios, uncritical, with little reflection and transfer of knowledge in the daily life of the educational actors, situations that limit the implementation of the inverted learning approach (Pozo-Sánchez et al., 2020; Yorganci, 2020; Öztürk & Çakıroğlu, 2021; Almodaires et al., 2019), and in turn, the task of internalizing and consolidating knowledge to students after class.

About the use of ICT during the teachers' pedagogical practice, their presence was noted more as a support resource for the educational process than as an active learning strategy, since, as stated by the participating teachers, the abrupt integration of these technological resources simply proceeded to intend to publish information and activities, However, this reality limited the possibility of discussion, socialization, construction and feedback necessary to guarantee the students' learning process, even more so when this comes from interactions in distance, remote or virtual contexts.

The pedagogical approach of inverted learning has its theoretical basis in the constructivist approach and meaningful learning, since it allows the application of innovative strategies, promoting

educational scenarios characterized by the integration and active participation of students in the review, discussion, reflection, construction and implementation of the knowledge generated inside and outside the classroom. This reality, to be adopted by teachers, requires techno-pedagogical training processes of ICT integration and active methodologies, as well as reflection processes oriented towards the change of attitude and critical disposition towards the integration of ICT as tools that strengthen their pedagogical practice, as well as the meaningful and experiential learning of the student.

It is notorious the need to design and implement a formative scenario with ICT under the inverted learning approach that allows strengthening all the weaknesses found in the analysis of this research to promote an active environment by the actors involved in the educational process, mainly in the student who should be the main actor of this training process that allows him/her to build knowledge for life, although, first it requires a change based on the reflection of teachers on their practices because inverted learning is a change from the inside out (Prada, et al., 2019). It can be seen that this inverted learning is a bottom-up learning model from the bottom up.

CONCLUSION

From the findings obtained, it is concluded that teachers do not apply an inverted learning approach in their pedagogical practice, even when they use video and virtual platforms as an accompaniment to the educational process. A learning environment prevails that does little to promote learning autonomy in which the concept of flipped learning can be presented, through the integration of other teaching strategies, such as flipped inquiry learning, flipped project learning and flipped peer teaching, all of which aim to realize flipped learning in the flipped classroom and achieve the goal of deep learning, to create a more active, dynamic and participatory learning environment conducive to successful learning.

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