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Article

Flipped classroom and favoring motivational and metacognitive development in middle and high school students.

Aula invertida y favorecimiento del desarrollo motivacional y metacognitivo en estudiantes de educación media y superior

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Abstract

This research sought to analyze the incidence of the Flipped classroom strategy in favoring the motivational and metacognitive development of middle and high school students from three educational institutions in the cities of Ibagué, Zipaquirá and Cali. For this purpose, a qualitative methodology was used, having an exploratory, descriptive and correlational scope, and an interpretative and comparative approach. Data collection was achieved by means of a questionnaire to students, a semi-structured interview to teachers and documentary review; these

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instruments were validated by means of expert judgment and piloting. The data analysis was carried out by means of categorical analysis matrices, using the Excel tool, which allowed an open codification of the data, to later identify recurrences and tendencies of the emerging and final findings; it was obtained that the flipped classroom enhances the motivational and metacognitive development in these students, activating in them interest, sense of participation, collaborative work and autonomy; this because the flipped classroom allows them a leading role in the construction of knowledge, assuming a very active role in their learning.

Key words: flipped classroom, self-regulation, cognition, blended learning, motivation.

Introduction

This research presented a problematization focused on improving educational efficiency in favor of motivational and metacognitive development, applying an flipped classroom strategy. Escanero (2019) refers that it integrates technology to academic activities through adequate structuring of technological tools and resources, (p. 45); favoring education through digital environments that, in turn, contribute to student self-regulation and development of conscious and reflective thinking about their learning process. Fuenzalida et al. (2020) consider that the progress in these interactive activities that occur in flipped classroom, presents a relationship between clear orientation with constructivist, dynamic and collective learning, through personal and self-regulated commitment of the student in the construction of their knowledge.

The objective was to analyze the incidence of the flipped classroom strategy in favoring the motivational and metacognitive development of middle and high school students in three educational institutions in Ibagué, Zipaquirá and Cali, formulating as specific objectives: To identify and apply pedagogical strategies of flipped classroom oriented to the favoring of motivational and metacognitive development in middle and higher education students; To determine factors that affect motivational and metacognitive development of students, in their blended learning processes through the Flipped classroom ; To describe motivational and metacognitive processes that students manage to develop from applying pedagogical strategies of Flipped classroom .

Subsequently, faced with the need to undertake a research process that led to the research question "What is the incidence of the flipped

classroom in the increase of motivational and metacognitive development of the students under study?", it is stated that this research is of great importance since the flipped classroom as a virtual space, favors the development and self-regulated training in various interactions between students and teachers. The problems caused by the low level of learning in students, face-to-face and blended mode, lead to think of a viable solution: implementation of the flipped classroom as a pedagogical strategy to favor learning motivation and metacognitive capacity, essential in self-regulation of learning, allowing teachers to have flexible time to create student-centered environments for optimal learning, transferring activities that are performed daily in the classroom to a virtual platform, where each student performs actions proposed according to their abilities, time, objectives and learning pace; Understanding that the organization of their own time, investment of dynamics and critical autonomy, will allow them to develop skills outside the academic environment, replicated in their social environment. Based on the fact that the expected results on self-regulated learning will be the basis throughout their education.

With the implementation of the Flipped classroom it is sought that students develop reflective thinking for problem solving, and critical thinking that generates autonomy, self-regulation of learning with creativity, analysis and innovation, promoting new forms of knowledge with an attitude of continuous learning in their self-training, representing a paradigm shift in the definition of the instructional process and establishment of goals and learning outcomes, justifying the research, as it serves to support students who, as a generality of today, fulfill various roles: students, workers, parents, and that due to multiple occupations, attendance to face-to-face classes are sporadic; thus resorting to this strategy, allowing personalized teacher-student interaction, reinforcing knowledge, clearing doubts and solving specific situations.

This research Chilingaryan & Zvereva (2017) convenient because scientifically and methodologically it will serve as a basis for teaching practice in which fundamental aspects for quality education are integrated, allowing flexible, dynamic and interactive teaching-learning processes that motivate students to the development of their autonomy and metacognitive capacity linked to strategic thinking and conscious and self-reflective processes in front of their learning.

The qualitative methodology was applied with an exploratory, correlational and descriptive scope, and a comparative, phenomenological and interpretative approach. A simple random sample was chosen, applying as instruments, a questionnaire to students, a semi-structured interview to teachers and a documentary review, whose reliability process was through expert judgment and piloting. As for the expected results, it was found that the flipped classroom significantly activated the motivation to learn; thanks to its flexible methodology, students are more interested in carrying out a deep, progressive and more meaningful blended learning. Thus, the Flipped classroom encouraged self-learning outside the classroom and contributed to forge autonomy, responsibility and metacognitive awareness, turning them into active protagonists of their learning process, since great academic responsibility is transferred to them; this makes them feel important and motivates them to assume a more proactive attitude in self-management of knowledge. It shows that there is a close relationship between the flipped classroom and the metacognitive development of students, since it provides an environment that generates a dynamic and integrating correlation, combining methodological processes of traditional education with those of virtuality, making the students' autonomy more externalized, mediated by technological resources and virtual learning spaces. The Flipped classroom helped students to obtain necessary information in times and places that do not require the physical presence of the teacher or tutor; this is how an integral approach was established that increased commitments and interactions of students for the construction of their self-learning, socializing it and integrating it to their own reality.

Materials and methods

The methodological procedure of analysis allowed guiding the research in relation to the stated objectives, obtaining valid and reliable results in total correspondence. The systematization process was carried out by means of categorical analysis matrices using the Excel tool, coding the data coming from each instrument, organizing them by research categories and subcategories. This research used qualitative methodology, in which students participate not as objects of study but as subjects interpreting educational phenomena. (Campillo-Serrano et al., 2013, p. 89), discovering and

understanding the educational practice rather than explaining it and allowed the analysis of strategies and activities proposed from the Flipped classroom model as a didactic strategy of self-regulation of learning in students of Bachelor's Degree in Early Childhood Education, Uniminuto, Zipaquirá Regional Center; Bachelor's Degree in Natural Sciences and Environmental Education, Universidad Popular del Cesar, Ibagué Regional Center; and Carlos Holmes Trujillo Educational Institution, Central Headquarters, Santiago de Cali.

The qualitative approach is a reflection link between researchers and participants (Dominguez et al., 2020), since the project focuses on actions experienced by provoking descriptive techniques and descriptive reviews: words of the subjects, oral or written and observable behavior, (Dominguez & Vega, 2020). The scope of the research was initially exploratory, taking into account what is pointed out by Pacahuala et al., (2021) these studies allow to become familiar with unknown phenomena, obtaining information about conducting comprehensive research in special environments of life, related to particular human behavior. (p. 35), determining variables that influenced the Flipped classroom strategy, favoring the motivational and metacognitive development of students in the study. It is a correlational type of research that allows relating variables, determining interconnections, analyzing if these variables are really correlated, or if they vary simultaneously; this correlation can be positive or negative, indicating tendencies; thus advancing towards the answer found in the research work.

Subsequently, it was descriptive, which is important since this type of study aims to describe situations and events in a given phenomenon, measuring variables as accurately as possible, based on knowledge of the area under investigation, after measuring one or more properties of the phenomenon described. In addition, it had a comparative approach, since the conclusions of the process compared the results of the application of instruments to students and teachers in the three institutions involved. Comparative studies seek systematic comparisons of cases of analysis that, for the most part, are applied for empirical generalization and hypothesis verification. This was also a study with a phenomenological approach, aimed at describing and interpreting fundamental structures of the lived experience. Phenomenology comprises school realities, emphasizing the practices of the actors of the formative process. Alemán et al.,

(2020). It is necessary to indicate that it had an interpretative approach, with a double interpretative process: it involves the way in which human beings interpret the reality they socially construct; and, it describes the way in which social scientists understand how humans socially construct their realities, fulfilling a preponderant role at the moment of extracting the most essential information provided by the feelings of students and teachers. (Muñoz et al., 2021, p. 48).

The sample comprised two groups of undergraduate students and one group of 11th grade, simple random, composed of 8 subjects from each study group. The field work in a qualitative research refers to being in the place of the facts that lead to the research through the application of instruments in the population under study where, methodologically, after formulating the objectives and choosing the data collection strategies, the process continues.

Initially, the data were systematized and analyzed for each instrument and population group until obtaining the emerging findings for each one; it should be remembered that the sample is composed of students from two higher education programs (Bachelor in Early Childhood Education - UNIMINUTO and Bachelor in Natural Sciences and Environmental Education - Universidad Popular del Cesar) and a group of high school students (grade 11 - Carlos Holmes Trujillo Educational Institution, Central Headquarters, Cali). Thus, data reduction by population group was initially achieved by using processes such as identification of recurrences or coincidence of answers, labeling and hierarchization of emerging findings. Subsequently, the data were cross-referenced in a unified matrix until the data were reduced to the final findings in correspondence, first by research subcategories and then by main categories. In addition, comparative analysis of the three study sample groups was made. During the process of triangulation of findings and theory, an interpretative analysis of discoveries was allowed, in relation to the research frame of reference, generating an exchange between data obtained in the answers of the questionnaire for students and the semi-structured interview with teachers, bearing in mind indicators that guided the analysis of results obtained in relation to answers derived from each instrument applied, finally expressing the comparative process and conclusions of the field work. The data analysis was made on each research category: Flipped classroom pedagogical strategies for motivational and

metacognitive development; Factors affecting motivational and metacognitive development in learning processes through the Flipped classroom ; Motivational and metacognitive processes; and Main contributions of the Flipped classroom to motivational and metacognitive development in the context of higher education.

Results

We emphasize that this research uses a qualitative methodology relevant to the subject, since it allows the analysis of actions proposed from the flipped classroom model as a didactic strategy for the enhancement of motivation for learning and the development of the metacognitive capacity in middle and high school students of three Colombian educational institutions. The data analysis was made on each of the research categories: Flipped classroom pedagogical strategies for motivational and metacognitive development, Factors affecting motivational and metacognitive development in learning processes through the Flipped classroom , Motivational and metacognitive processes.

The results are presented through each of the research categories and subcategories.

Table 1. *Research category: Flipped classroom pedagogical strategies for motivational and metacognitive development.*

Subcategory: Flipped classroom pedagogical strategies that enhance motivation for learning.	
Final findings	
Inverted group class	The active interaction with the resources seen among the students through the virtual platform in the asynchronous meeting allows learning and participation, achieving the formation of teams to work together on the contents in the virtual platform and receiving active feedback among peers. It is notorious that this type of group

	inverted classes activate in an important way the motivation for learning.
Traditional flipped classroom	The construction of shared knowledge, the active preparation of students prior to class and personalized feedback in the virtual classroom, become traditional basic steps in the academic process of students that generate great motivation for learning.
Inverted debate class	Guided or guided orientation and documentation through the virtual platform for the preparation and participation in communicative spaces for free opinion, debate, dialogue and joint reflection, are pedagogical strategies that significantly raise the motivation for learning in these students.
Subcategory: Flipped classroom pedagogical strategies that enhance metacognitive capacity.	
Final findings	
Realization of projects in the real context	The active and dynamic training through active work, the resolution of everyday life problems by the students provides them with an orientation in training for work, as well as the development of an investigative and autonomous spirit.
Problem-based learning	Working and gathering information in a team with a good participation in their learning provides the student with

	greater autonomy and reflection for the solution of problems.
Teamwork	Teamwork allows the student to develop critical thinking and learning, participatory, which motivates him/her to overcome new challenges.
Development of self-directed learning skills	Learning to learn and the ability to learn on one's own motivates the student and to keep in mind how important it is to get good grades.

Note. Table 1. Flipped classroom pedagogical strategies for motivational and metacognitive development. Source: own elaboration.

Regarding the first specific objective of this research, which sought to identify and apply flipped classroom pedagogical strategies oriented to favor motivational and metacognitive development in these middle and high school students, it was found that strategies such as the development of the group flipped classroom , the use of the traditional flipped classroom and the debate flipped classroom , are the ones that stand out the most in this study population, as they are the ones that most motivate them to learn and to develop their metacognitive capacity. Among the flipped classroom strategies identified and applied in the teaching-learning processes of these middle and high school students, these are the ones that showed the greatest enhancement of interest in learning, which allowed activating more the impulse and desire in them to empower themselves in their own learning process.

The development of strategies such as the inverted group class, allowed these students to work on the contents in the virtual platform and provide feedback to each other, generating synergies that give them greater security and confidence, which allowed them to activate their interest and experience learning with greater pleasure and enjoyment; having the possibility of collective learning in which these students feel that their contributions and opinions are important

to others, makes them develop a much more positive concept of themselves in relation to their capabilities.

Likewise, the inverted debate class, turns out to be a strategy that activates motivational processes in these students under study, since they have the possibility of previously recognizing all kinds of audiovisual and multimedia resources that teachers propose to arouse in them analysis and reflection that allows them to later socialize and debate with their peers in synchronous spaces. generating in students high academic effects, better understanding of topics and concepts and greater willingness to pedagogical work, feeling more motivated (Merla and Yánez, 2016, p. 74).

Similarly, the traditional flipped classroom is another strategy that is still very attractive for these students under study, as it gives them the opportunity to prepare for class beforehand and receive feedback in the virtual classroom, generating in them greater interest and desire to continue their learning process. The teacher provides a series of topics through a video, an image or a text that the student must consult and the class time is to confront, clarify, build, and apply that theory in practice" (Krainer et al., 2017, p. 325).

Finally, it was evidenced that the flipped classroom facilitates the development of self-directed learning strategies, since it provides interactivity possibilities so that the student can "learn to learn" achieving self-control and permanent monitoring of their learning process. It was evidenced that the flipped classroom contributes to the development of critical thinking skills, allowing these students to establish learning objectives in a more leisurely manner. Skills such as analysis, judgment, appreciation and communication adjusted to critical thinking.

Table 2. *Research category: Factors affecting motivational and metacognitive development in the learning processes through the flipped classroom.*

Subcategory: Internal factors for motivational and metacognitive development in learning processes through the flipped classroom.	
Final findings	
Academic support in situations of illness and personal eventualities, with the provision of specialized pedagogical materials and resources for autonomous learning.	The availability of all kinds of teaching materials and resources on virtual platforms means that the teacher is no longer the main source of knowledge, and the student takes a much more active part in their academic commitments, even having greater autonomy in managing their time; something that benefits them in situations of adversity (health problems and all kinds of eventualities). This possibility activates their motivation to learn much more.
Possibility of strategic pre-recognition of the lessons uploaded on the virtual platforms.	The varied implementation of appropriate materials in the virtual platform and the exploration of the contents strengthen the conceptual understanding and contribute to the academic strengthening of the student. Having the possibility of having the lessons previously loaded on the platforms, allows them to think strategically about how to face these lessons; something that encourages them in their learning.

Possibility of strategic management by students to actively involve their parents in their learning process.	When there is the possibility of integrating parents in the learning process, the student feels supported and acquires higher levels of confidence and security, which translates into motivation to learn.
Pedagogical mediation of the teacher in the processes of autonomy and self-control of students in relation to their learning.	When the teacher assumes the role of mediator, providing tools for the student to assume a much more protagonist position in the learning process, and when he/she allows him/her spaces to forge his/her autonomy, self-control and awareness of his/her learning, his/her metacognitive capacity increases and so do his/her levels of motivation to learn.
Subcategory: External factors for motivational and metacognitive development in learning processes through the flipped classroom.	
Final findings	
Possibilities of access to ICT tools.	Having the technological resources and the skills to manage them is indispensable for the training process, since having the possibility of access to ICTs favors motivation and the metacognitive process. Having access to ICT tools increases students' autonomy in their own learning process, so that they are able to relate problems to be solved and skills to be developed with learning needs and purposes, as well as to search for the

	necessary information, analyze it, generate ideas to solve problems, draw conclusions and establish the level of achievement of their objectives.
Desire to learn	The innate feeling of self-improvement in the student becomes a factor that drives him to learn and motivates him to be an active protagonist of his own learning process. Thus, by becoming more empowered in their processes, they are able to focus in a better way in the approach and fulfillment of goals, putting all their interest and curiosity to know and learn, thus achieving a significant learning articulated with critical and individual thinking that encompasses their own interests.
Subcategory: Personal factors for motivational and metacognitive development in learning processes through the flipped classroom.	
Final findings	
Commitment	The importance of academic growth makes them forge responsibility in what they propose, giving importance to academic spaces, thus achieving the fulfillment of their goals. When students acquire an important level of commitment, they become more involved in their academic purposes, and by being more immersed in these processes, their level of motivation increases significantly.
Self-esteem	The reinforcement of positive thoughts in the student, the positive valuation of what he/she does, the affection he/she has for him/herself and the concept he/she has of his/her capabilities, reinforces self-esteem and gives

	him/her the strength to achieve what he/she desires. The student configures a positive image of himself in terms of his capabilities and potential, acquires higher levels of security and confidence, fundamental elements to assume a more active position in his learning. All this confidence and security becomes motivation.
Will and determination	The student's will and determination are fundamental aspects to encourage him to work on the fulfillment of his cognitive purposes in a self-regulated manner. All the intention and decision lead him to motivate himself towards the fulfillment of his learning objectives.
Compliance with standards	When a culture of compliance with agreements and rules is generated in the student's social environment, this has a positive impact on self-discipline in their learning processes. This makes them develop better planning, organization and self-control of their academic processes; aspects that have an important influence on their level of responsibility. As students feel empowered in their learning and feel in control of it, their motivation increases significantly.
Subcategory: Social factors for motivational and metacognitive development in learning processes through the flipped classroom.	
Final findings	
	Close and empathetic relationships between students and teachers generate the first positive expectations in motivational and metacognitive terms, since the closeness in

Student-faculty relations	their realities and feelings translate into affection, motivation and empowerment in the face of learning.
Selection of friends inside and outside the Institution.	Friendships influence the student's expectations, taking into account the affinity in goals and dreams with their peers, within the construction of identity. Expanding the circle of friendship generates well-being and motivation in the student, in addition to feeling supported by others and having the possibility of weaving learning in a network; not only in academic matters, but in those of life itself. Friendship circles become spaces for cooperative and fraternal work.
Identity with the Educational Institution	The creation of attributes that guide students forges bonds with the institution. When students are able to connect with the institutional mission, vision and objectives, when they are able to internalize them and find their meaning, they will certainly feel much more motivated to learn and to actively take charge of their learning; they will be able to integrate themselves in a much more participatory manner in all institutional affairs.

Note. Table 2. Research category: Factors affecting motivational and metacognitive development in the learning processes through the flipped classroom . Source: own elaboration

With regard to the second specific objective oriented to determine the factors that influence the motivational and metacognitive development of these middle and high school students in their learning processes through the flipped classroom , it was obtained with respect to the internal factors for motivational and metacognitive development, where students express a sense of motivation when determining that the flipped classroom , defined by

Melo, et al (2010) as a pedagogical orientation in which direct instructions mobilize from collective learning spaces to individual student learning, having autonomy in the management of their study time and permanent access to specialized pedagogical resources that the teacher provides according to their special needs of the moment. Thus, by linking this strategy to personal learning environments, we undoubtedly obtain environments that generate dynamic and integrating synergy combining advantages of both traditional education and virtual learning, where the autonomy of the teacher also becomes more evident, by delegating to their students processes that they develop collaboratively and in a network. This motivated them to develop autonomous processes and strategic self-control to achieve their learning objectives.

Another internal factor is the prior strategic recognition of lessons that are posted on the virtual platforms, allowing them greater security and confidence in approaching the topics of their lessons. The flipped classroom also allows the teacher to give a more individualized treatment, covering all phases of the learning cycle: knowledge, comprehension, application, analysis, synthesis and evaluation.

The results showed that this method of inverted learning allowed students to have a greater possibility of strategic management with the active involvement of their parents in the learning processes as a relevant motivational and metacognitive factor, feeling supported in their processes of self-regulation and learning monitoring. The participation of parents in the education of their children, research shows its importance in educational achievements of students, related between variables of family support in the pedagogical environment and efficiency of academic performance Hortigüela et al., (2017).

Teachers from pedagogical environments do not have the exclusivity of learning; parents are a great way to help students learn in and from different contexts. It is evident that the educational level of parents is directly related to the academic performance of their children; thus, the more years of education completed by parents, the more and better the time of dedication they offer to their children students, as well as the quality of supervision in their processes.

Another internal factor that influences the motivational and metacognitive development of these students has to do with the pedagogical mediation of the teacher so that they develop processes

of autonomy and self-control of their learning. Some characteristics of the teacher as a mediator in the autonomous and self-control processes in his students are based on open communication, in the consolidation of critical thinking and development of the investigative spirit, aspects that are fundamental for the development of autonomous, meaningful and collaborative learning.

In relation to the external factors that favor the motivational and metacognitive development of these students, the importance of providing, on the part of the family, adequate technological resources that benefit them in the acquisition of their achievements and fulfillment of academic objectives was found. It should be emphasized that both teachers and students who lack such resources for the development of their processes in the flipped classroom will have difficulties for the adequate development of their academic process.

It was found that ICT tools increase students' autonomy, allow them access to the necessary information to analyze it, generate ideas to solve problems, draw conclusions and establish the level of achievement of their objectives. In the face of these external aspects, it was noted that students have extrinsic motivations related to the desire to overcome, to become testimonies of resilience, inspired by the desire to transform those realities that exist in their social environments.

As for the personal factors that most influenced their motivational and metacognitive development, the level of commitment with which the students assume their own academic process stands out. Here the metacognitive capacity that is enhanced in these students by means of the flipped classroom makes a lot of sense, since this methodology leads them to be more autonomous and self-efficient. On the other hand, it was found that aspects such as the level of self-esteem is a determining factor for students to be motivated and develop their metacognitive capacity. The fact that students are able to act with greater autonomy over their own learning process, being able to know and control the influence of their personal characteristics such as self-esteem, provokes a sense of motivation in the development of their metacognitive capacity.

The reinforcement of positive thoughts in the student, as well as the positive valuation of what he/she does, the affection he/she has for him/herself and the concept he/she has of his/her abilities, reinforces self-esteem and gives him/her the strength to achieve what he/she

desires, and all this confidence and security becomes, in turn, motivation. In this sense, the flipped classroom allows diverse communicative channels for the teacher to activate processes of positive self-recognition in terms of self-image, self-esteem, among others.

Other relevant factors according to the results obtained are related to willpower and determination, fundamental aspects in the fulfillment of their cognitive purposes in a self-regulated manner, improving planning, organization and self-control. There is a close relationship between motivation, learning and execution, influencing both learning and what the student executes in his learning, increasing or decreasing his motivation.

In relation to the social factors that most influenced motivational and metacognitive development, it was observed that peer relationships influence students' expectations and the construction of their identity, weaving networks that provide them with well-being and motivation. With respect to the level of potential development, it has to do with what students are capable of achieving with the help of their peers or mediating elements. The secret lies in teachers guiding the work of the zone of potential development in their students with the necessary elements for the progress of their learning.

Table 3. *Research Category: Motivational and metacognitive processes*

Subcategory: Processes of learning motivation	
Final findings	
Increased interest in taking responsibility for learning and moving toward academic success	The commitment to finish activities on time, to keep up with academic commitments, through good habits, commitment, effort to keep up with academic commitments and thus meet personal goals. In the Flipped classroom , the teacher as coach and the student as protagonist of the

	learning process, make all these processes are enhanced.
Greater enjoyment of the academic process, due to the conscious recognition of the meaning of learning for life.	Awareness of the importance of what is learned by putting it into practice in the context of reality, fulfilling their goals, becomes a motivational factor of great importance.
Encouragement to learn at your own pace and with self-efficacy.	The development of reflective thinking leads to students learning at their own pace, strengthening the assimilation, interpretation and consolidation of knowledge with clarity; something that has an impact on their interest and desire to learn. In this sense, the Flipped classroom is a good ally, given its flexible blended learning methodology.
Desire for self-improvement	The student as the builder of his own learning, with will and determination, sets out on his life project to improve himself and transform the reality that surrounds him; here the extrinsic motivation that leads him to the planning, follow-up and permanent monitoring of his objectives is evident.
Subcategory: Metacognitive processes	
Final findings	
Encouraging student participation in their learning	The student who assumes greater responsibility for his or her academic commitment is the main actor in the

	process, providing personalized, participatory learning in order to enhance teamwork. Here, the flipped classroom plays a preponderant role since it encourages both individual and collaborative learning.
The student as an active protagonist of his or her learning process.	The committed student is dynamic and contributes ideas from his experience or acquired knowledge, leaving aside his passivity. Assuming the leading role in which the student develops self-directional processes in some cases and the teacher acts as a coach and facilitator, leads to the forging of autonomy, strategic thinking and metacognitive awareness.
Strategic monitoring and self-monitoring in the planning, organization and time management processes.	The planning and organization of activities helps to manage time and be recursive in solving problems. Definitely, the flipped classroom helps to develop processes of self-control, self-monitoring and permanent self-monitoring.
Increased levels of autonomy and assertiveness in decision making	It is evident that the flipped classroom leads the student to develop his decision-making capacity, since it transfers to him a large part of his formative process, which demands capacity for autonomy and self-management.

Note Table 3. Research category: Research category: Motivational and metacognitive processes. Source: own elaboration

Another determining factor for motivational and metacognitive development is the sense of relevance, which was achieved when students felt identified with the institutional horizon, which motivated them to learn in an active and participatory manner in all academic processes. The Flipped classroom methodology in these cases was an important ally for the institutions and teachers, since through technological platforms and resources, institutional identity can be strengthened.

With reference to the third specific objective aimed at Describing the motivational and metacognitive processes that these middle and higher education students manage to develop, from the application of pedagogical strategies of the flipped classroom , it was evidenced in the students that motivation is reflected when they assume responsibilities and self-regulation that allows a better assimilation, interpretation and consolidation of knowledge at their own pace of learning, moving with determination towards the achievement of their objectives.

Within the metacognitive processes that were evidenced in the students when applying pedagogical strategies of the flipped classroom , it was found that their sense of participation was fostered, allowing spaces for interaction, free expression, debate and the construction of shared knowledge. The fundamental aspect of the model is to establish a match between the different types of learning of a group of students that make up a class and the teacher's teaching style.

Discussion

This research process indicated that the flipped classroom methodology offered a deep ingredient of responsibility and motivation of students in the appropriation of information to transform it into knowledge. Taking into account these premises, the students of the three groups studied, showed that they perceived positively the benefits of the flipped classroom , finding that the main contributions of the flipped classroom to the enhancement of motivation for learning in these students of middle and higher education, that the flipped classroom enhances the interest and sense of participation, making them feel impulse and desire to learn through interaction, work and collaborative construction, dialogic spaces and debate with shared knowledge of opinion and free

expression; process of an flipped classroom methodology that provides all kinds of channels and technological resources for this interactivity. Another of the main contributions is the place that the flipped classroom gives to the student, turning him/her into an active and empowered subject who assumes his/her protagonism in the learning process, responsible for bringing his/her academic process to a successful conclusion.

Regarding the main contributions of the flipped classroom to metacognitive development, it was evidenced that it favored in them autonomy, commitment, diligence and analysis, which allowed a wide participation of students in activities planned in the classroom, becoming aware of their weaknesses and strengths and generating information analysis skills in an objective manner, always in search of quality and the value of doing things well. With the application of this methodology, the students under study became aware of and regulated their own basic mental processes involved in their cognition. One of the incidences in this aspect is that they significantly improved their metacognitive skills when using the flipped classroom , becoming aware of their learning, showing an increase in strategic, conscious and self-reflective skills; that is, as they learn with the application of this technique, the students improve their metacognitive skills. It became evident that the flipped classroom contributes to the development of their critical thinking skills and facilitates progressive learning, establishing slower learning objectives; in addition, it favors collaborative work, which is fundamental to build knowledge from synergies among peers.

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