How to Cite

Barrero-Zambrano, L. G., & Ávila-Rosales, F. M. (2022). Learning in the subjects of the common trunk in the autonomous reasoning of the students of the basic elementary sublevel. *International Journal of Social Sciences*, *5*(3), 176-183. https://doi.org/10.21744/ijss.v5n3.1921

Learning in the Subjects of the Common Trunk in the Autonomous Reasoning of the Students of the Basic Elementary Sublevel

Linda Gabriela Barrero-Zambrano

Maestría en Educación Básica, Universidad Laica Eloy Alfaro de Manabí, Extensión Chone, Manabí, Ecuador Corresponding author email: linda.barreto@pg.uleam.edu.ec

Francisca Margarita Ávila-Rosales

Universidad Laica Eloy Alfaro de Manabí, Extensión Chone, Manabí, Ecuador

Email: francisca.avila@uleam.edu.ec

Abstract---The objective is to analyze learning in the subjects of the common core, for autonomous reasoning in students of the basic elementary sublevel, of the Educational Unit Fiscomisional Cinco de Mayo of the city of Chone in the year 2022. The lack of materials for the development of the tasks and the ease to answer the tasks with very little effort were evidenced. The descriptive research was carried out by relating the techniques and strategies that were used, such as: surveys of students, parents, and observation sheets, having a population of 108 students and 107 parents. The result was that the developed research served to verify the stated objective, verifying that the teachers use the materials related to the subjects of the common trunk to develop the autonomous reasoning of the students and these develop practices according to the given contents, while the Parents support their children in school activities.

Keywords---autonomous reasoning, common core, elementary basic, learning, subjects.

Introduction

The study that supports the research is supported by Pérez (2021), which mentions the learning and new behaviours of a living being from previous experiences, to achieve a better adaptation to the physical and social environment. in which they develop, also for (Villanova, 2016), learning is a phenomenon that occurs so naturally that sometimes the person does not even do it consciously. The methodology focused on elementary knowledge of basic sciences, the quantitative method was used as referred to (Barnet-López, 2017).

The topic on learning in the subjects of the common trunk in the autonomous reasoning of the students of the elementary basic sublevel was developed to analyze the learning in the subjects of the common trunk for the autonomous reasoning in the student, considering this the definition of learning (Pérez & Gardey, 2018), who call it the process of acquiring knowledge, skills, values and attitudes, making it possible through study, teaching or experience" (p. 11); while for (Valladares, 2016) "learning is the result of the interaction of previous knowledge and new knowledge; as well as its adaptation to the environment, which will function at a certain moment in the life of the students.

This work is motivated by the urgent need to seek autonomy in the learning of elementary school students, as problems of this nature are evident, such as the lack of attention caused by distractors that they have near the study area, and when talking about distractors I emphasize the technological ones that although what is mentioned by Polanco (2017), is true, who affirms that the inclusion of technology in teaching in general, and in modern languages in particular, continues to arouse a high degree of interest and its use in educational settings is increasing.

The little or no presence of some parents at the time of supporting their representative in the subjects studied and the reinforcements they need, however, there are also factors such as the ease that occurs in the development of the student's task is another cause of the learning deficiency in them, when the father of the family helps his son,

facilitating the answers to the activities that he must reason with autonomy, for a significant apprehension of the imparted knowledge, causing a lack of autonomy, and making the student very dependent (Thuneberg et al., 2018; Rhim et al., 2020).

According to what was said by Álvarez Fernández (2006) defines "paternalism" as the tendency to apply the norms of authority or protection traditionally assigned to the father of the family or other areas of social relations such as politics and the world of work. Another problem that was evidenced during the approach to the studied topic is that many parents do not provide the necessary material so that the children can work during their class hours, causing disinterest and leading to bad behaviours.

It was found that the lack of rules and values in the home has a significant impact on learning since a child builds the foundations of his house where the family is responsible for forming these values, lacking them he will not develop his tasks in the educational institution, also failing to comply with the duties and responsibilities they have as students at home. Electronic distractions such as television, telephone, radio and computer near the study area do not allow the child to concentrate, if he receives classes in a room where his brother also receives his, this interferes with his preparation as a negative effect that will be affected by the difficulty of attention that the child will have when acquiring their learning and as a consequence, they will not be able to reason autonomously (Bork et al., 1994; Sunde et al., 1997).

Learning is important within the scope of formative instruction that everyone must have in their academic alignment; therefore, applying strategies or resources that promote the activity of attention and understanding in students will help them develop within the spontaneous processes of discernment of knowledge. In this context, there are subjects where the teacher must be in constant interaction to promote good autonomous reasoning in students and thus avoid negative behaviours in their tasks. In Ecuador, quality learning is prioritized for all students in their interlearning process without exception. In the curriculum of the year 1996 and 2016, even though a pedagogical model is not expressed to apply in the educational institutions that offer the basic level, constructivism is the model to follow and base on the level of basic general education since the year 1996.

The (Ministry of Education, 2016) projects its educational proposal based on: "the comparative study of the curricular models of other countries and especially, the criteria of Ecuadorian teachers with curricular and disciplinary experience in the areas of language and literature, mathematics and natural sciences, social sciences, cultural and artistic education and physical education of the two educational levels were the basis for the curricular adjustment (p. 6) The learning in the subjects of the common trunk corresponding to the formation of the students has allowed them to acquire certain essential basic knowledge.

In the Ecuadorian context, unfortunately, the highest levels have not been promoted in the subjects of the common core in the elementary basic sublevel; In addition, a reflective thought has not been built that guides the fulfilment of personal learning objectives pre-established by the Ministry of Education, such as understanding in the autonomous reasoning of students, which has been deficient in academic training. At the level of Manabí, this problem is also evident, since there is a lack of strategic methodologies that reinforce learning in the subjects of the common core in the elementary basic sublevel, which has not allowed students to reason freely and individually, that is, not they have their analysis, the same one that has not been developed because it is only intended to cover the basics in most subjects. Autonomous knowledge and reasoning are minimal to improve the quality of student learning (Zaharija et al., 2013; Abelairas-Gómez et al., 2020; Landerl & Kölle, 2009).

The investigation of this student problem was carried out in the interest of knowing why the group of elementary school students of the Cinco de Mayo Fiscomisional Educational Unit in the city of Chone has grown, with autonomy deficiency. It is of academic interest because it aims to increase the learning of the subjects of the common core of elementary school students in terms of autonomous reasoning. It is important because it is a major part of the social welfare of students. After all, their professional growth will depend on the proper use of reasoning (Hänze & Berger, 2007; Lin et al., 2003; Schnotz & Bannert, 2003). In the professional field, as an educator, the interest is in knowing the family context of each student to identify from the foundations the causes that cause a said problem that has to learn these subjects as an independent variable.

Materials and Methods

It was based on the different basic modalities of research, the documentary bibliography, which (Morales, 2017) is a scientific procedure, a systematic process of inquiry, collection, organization, analysis and interpretation of information or data around a certain topic; and from documents such as articles, theses, books, related to learning and autonomous reasoning, it was possible to determine specific study factors and important guidelines.

Field research was used, which Arias (2016), states that it is the one in which the data is collected or comes directly from the subjects; This type of research consisted of gathering information regarding learning in the subjects

of the common trunk that the elementary school students of the Educational Unit under study possess, in which the technical and scientific criteria were identified based on particular general concepts of the research and an analysis of the data obtained in the surveys determining the problems that learning entails in the subjects of the common trunk in reasoning.

It was explanatory, knowing that it is in charge of looking for the reason for the facts by establishing cause-effect relationships, this allowed establishing that learning in the subjects of the common core influences autonomous reasoning, and specific study factors can be determined. and important guidelines when solving students (Arias, 2017). The level of the investigation was exploratory, which likewise (Arias F., 2016), defines as that which is carried out on an unknown or studied subject or object, where the results constitute an approximate vision of it, a superficial level of knowledge, consisting of accessing external information to be able to analyze it, concluding with the stated objective.

Conducting surveys corresponds to exploratory, search and discovery techniques, the Descriptive Level was also used, because everything about this report was observed and the results were analyzed throughout the research process. The deductive-inductive method of cause and effect was used in this study, which starts from general concepts of the investigation and proposes proposals that solve the problems found (Dávila Newman, 2016). The analytical-synthetic, an analysis of the data obtained in the surveys was carried out, determining the problems that learning in the subjects entails in duly justified autonomous reasoning (Colmenares, 2018).

The field research consisted of collecting information regarding learning in the subjects under study, which the elementary school students of the Educational Unit have through surveys and observation sheets made to 75 parents and 78 elementary school students of the educational unit. Surveys and observation sheets for students and parents were used as instruments to analyze the learning of the subjects and thus be able to obtain autonomous reasoning (Johnson, 2016). This allowed demonstration of the results that are given through the tabulations through an investigation.

Analysis and Discussion of the Results

The research was carried out based on the subjects of the common trunk and the autonomous reasoning of the students of the basic elementary sublevel of the Educational Unit Fiscomisional Cinco de Mayo of the city of Chone, as a result of different educational obstacles that are currently presented, due to factors such as virtual education that was carried out by the pandemic presented, and that caused many changes to education, which have been effects that have caused limitations in student learning. An analysis of the most relevant topics that helped in the development of this article was carried out.

Learning

Learning is the result of the interaction of previous knowledge and new knowledge, adapting to the context and being functional at a certain moment in the life of the individual, it is also the post-strengthening of the biopsychosocial-affective attitudes of the same through the application of strategies based on the appreciation of reality through their own experiences and logic of the sensory channels. The process of acquiring knowledge, skills, values, and attitudes is developed through study, teaching, or experience (Ponce & Rodríguez, 2020). This is a process that is understood from different positions, there are different theories linked to the fact of learning, behavioral psychology, for example, describes learning according to the changes that can be observed in the behaviour of an individual (Pérez Porto & Gardey, 2018).

The most meaningful learning is enhanced through discovery, which involves providing students with opportunities to actively manipulate objects and transform them through direct action, such as actions where they explore, analyze or process each piece of information; it can be argued that this is done by metacognition; learn to learn (Bruner, 2016), based on their previous knowledge and that recently acquired, integration can be achieved, and they learn better.

The didactics of learning have both for the teacher and for the student, a double character as the formative and informative, where the informative, is known by the teacher, as the diverse problems of the techniques or methods and procedures of learning; the formative aspect needs the previous one, but it depends more on the intelligent and well-oriented practice, on the investigation and the deep elaboration of the concepts. Teaching is the action of learning and the time that this action takes; Likewise, it is the process where the individual is trained to solve situations, by which the mechanism goes from data acquisition to the most complex way of collecting and organizing information, according to (Navarro, 2017).

In this sublevel the student develops cognitive and social skills, which allow them to relate and strengthen socialization with others, through direct action, in groups or individually, which contributes to understanding positively and effectively, exercising their duties and rights (Ministry of Education of Ecuador, 2019).

Likewise, he identifies with his family, his social, cultural and material environment, recognizing his home, school and parish, as well as the basic elements of your image. Learn and define renewable and non-renewable resources, which represent using different techniques. That is why, from this context, the Common Core subjects are presented for this sublevel, which is made up of the basic areas that are: language and literature, mathematics, social studies, and natural sciences.

At this sub-level, teachers are involved in laying the foundations for the formation of skills that support the development of competent readers, speakers and writers who can use writing tools, and also communicate their ideas. This task is not limited to elementary literacy but must bring students closer to written culture and the different indigenous languages of Ecuador (Ministry of Education of Ecuador, 2019), such as Kichwañol (Marinely et al., 2022).

Teachers should work with students to develop basic thinking skills so they can solve simple problems involving addition, subtraction, multiplication, and reduction of various scales. Thus, students learn to communicate, record and interpret basic graphs and statistical models, to solve difficulties that arise in everyday situations. At this elementary sublevel, the student understands the cycle of life, knowing their body, function, structure, capacity for expression, movement, and artistic and playful memories (Mero, Zambrano, & Rodríguez, 2020). Also connecting to the knowledge of the ancestors with astrology and agriculture.

Autonomous reasoning of the students

In the process of autonomous reasoning, what is going to be deduced or learned must be representative for the student, have logical sense, and sequence and by following a good intellectual level, as well as the didactic material that is used. must use, since it must be composed of elements organized in an organized structure that allows the understanding and meaning of what you are going to learn. Independent reasoning is the process through which new abilities, skills, knowledge, behaviours, or values are acquired because of study, experience, instruction and research (Salazar, 2017).

This is how it is manifested that biopsychosocial factors currently influence the student's education and training process to fully develop students' reasoning at a cognitive level, academic performance, and attitudinal area. In this sense, the incorporation of new technologies and the media are tools that allow learning reasonably and responsibly, since it seeks self-learning and new strategies and learning models can be incorporated into them, which will favour the autonomous reasoning. of the students. Teachers must create responsibility in their students and make them aware that completely autonomous students can be achieved.

Autonomous reasoning is the faculty that the person must direct, control, regulate and evaluate their way of learning, consciously and intentionally using teaching strategies and thus achieve the desired objective (Manrique Villavicencio, 2016). This is an autonomy that has an end in education, in which it is expressed in knowing how to learn, therefore, the student can carry out their autonomous reasoning, with the use of their faculties of reason, reach high levels of self-education, the same one that will be prepared to act correctly using their free will, but they are responsibility and commitment in their integral formation.

Technological

Resources Technological resources are very important pedagogical tools within the classroom since it has allowed to invigorate and innovate the teaching-learning process through interactive classes that have helped comprehensive development, thus enhancing the work of the teacher by developing skills and abilities. in their students (Hayes, 2017). Technological development has brought with it in education a positive force and influence on the lives of both students and teachers, the different computer applications intervene in the education process with pedagogical strategies that lead to autonomous learning and facilitate the techniques or methods of teaching.

The study of autonomous study in educational training reflects the degree of acceptance and contribution offered by technological resources to autonomous learning activities (Flores Rivera, 2016); being the student and the teacher the actors who perceive this opportunity to increase and improve their capacities thanks to the application of these technological tools (Sánchez & Rodríguez, 2021). Autonomous learning is a competence that is built based on the discipline and perseverance of the individual, it is a principle that sets the standard for the achievement of new

knowledge, which is why technological resources cover a great context within learning and reasoning. in such a way that they are jointly related to technological tools, bringing with them new, more versatile, and efficient learning strategies, strengthening knowledge and academic performance.

The methodology that has been used in this research work was based on the compilation of statistics that served to verify the objective in parents and students, respectively: Identify the support of parents in understanding the content of the study; determine the rules and values in the home for the development of curricular and extracurricular tasks of the students. The results were reflected in tables for their respective analysis and interpretation of the results that were collected to know how the learning was being carried out in the subjects of the common trunk in the autonomous reasoning of the students of the basic elementary sublevel, and they were presented in an as follows:

Parents were consulted to find out to what extent they support their children in homework, results are shown in Table

Table 1
Parental support for their children

Alternatives	Frequency	Percentage (%)
A lot	59	79
Little	15	20
Not	1	1

Of the 75 elementary school parents surveyed, 79% are very supportive of their child in schoolwork, 20% of these parents mention that little help is given to their children in schoolwork, and 1% of elementary school parents do not support their child in schoolwork at all. Therefore, it is highlighted that a high percentage of elementary basic family parents of the Cinco de Mayo fiscomisional school is giving the necessary support to their son or daughter in the tasks of the schoolchildren. Parents were asked what knowledge of studies they had to assess the support they could offer their children. Table 2 shows the results obtained.

Table 2 Knowledge of study contents

Alternatives	Frequency	Percentage (%)
A lot	51	68
Little	18	24
Not	6	8

68% of the parents of basic elementary families surveyed consider that they know a lot about the study contents, 24% of the parents mention that they know little about the study content, and 8% of the parents surveyed indicate that they know nothing about the study content. Determining in this way, that a very high percentage of parents know about the contents of studies taught to their children, will help improve the understanding of the topics studied since they will be able to facilitate the respective explanation to their representatives. The ability of parents to support their children's understanding of the content at home was investigated. Figure 1 shows the results.

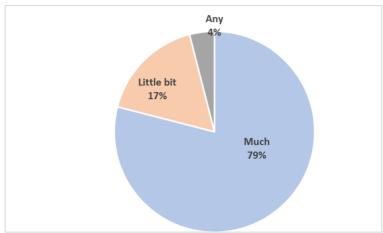


Figure 1. Content understanding by parents

Of the 75 elementary school parents of the Cinco de Mayo fiscomisional educational unit who were surveyed, 79% indicated that they have skills to support their children's understanding of content, on 17% indicated the little option, indicating that they have little capacity to fulfil this task and 4% state that they can support content compression. Therefore, it can be determined that a large percentage of elementary family parents of the Cinco de Mayo fiscomisional educational unit indicate that they can support their children concerning their abilities to understand the content. An observation sheet was applied to the students to know if the children comply with the rules established by their parents, and the results shown in figure 2 were determined.

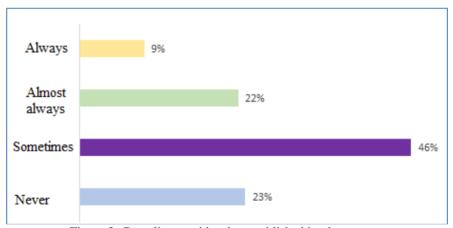


Figure 2. Compliance with rules established by the parents

Of the 88 students in elementary school of the educational unit that were observed, 46% sometimes comply with the rules established by their parents, 23% of the children observed never do so; 22% do it almost always, and a small amount that is equal to 9% always does. From the results obtained, it can be deduced that a large percentage of elementary school students observed find it difficult to comply with the rules established by their parents, seeing that it is really important to look for the machine so that the rules are fulfilled by them.

It was inquired if the children respect their turn, when intervening, in classes, the results are shown in Table 3.

Table 3
Respect for the turn in the intervention in classes

Alternatives	Frequency	Percentage (%)
Never	13	17
Occasionally	24	31
Almost always	36	46
Always	5	6

46% of elementary school students who were observed almost always respect their turn when intervening, 31% of these students sometimes respect their turn, 17% never respect their turn and a minimum of 6% of students They always respect their turn. Clear rules must be implemented regarding the use of the word and respect for those who are using it since it can be observed that a high percentage do not comply with the indication of the values of formal education, where the teacher should be expected to indicate the right moment.

It is necessary to take into consideration that to achieve significant learning in students, teachers and parents work in a unified manner; teachers in the activities must consider the level and age of learning of the students to plan the classes, also taking into account the resources and materials suitable for them; while parents must offer the help and support that their children need; and with this, it will be possible for them to acquire the best theoretical-practical educational knowledge that will serve them throughout their lives.

Within this same environment it is also important to keep in mind that when parents communicate with teachers, they learn to appreciate more the work they do and the challenges they face, making them feel more appreciated, because of the dedication that parents of the family put in the development of their children's task make them autonomous in their duties and responsibilities supported by the values and respect that they must have when imposing the rules; since teachers notice significant changes in their classrooms when parents are involved in their learning, from motivation and performance to self-improvement; This partnership between teachers and parents is essential because they can identify needs and goals, reaching consensus to contribute to their education.

Technological resources within the teaching-learning process represent a useful tool when working with them, in this way students improve their education by stimulating their talent. Teaching and learning must keep pace with technology; always looking at the environment in which boys and girls grow up and are educated with scientific responsibility, that is, what they observe on internet pages and social networks must be monitored, applying the same common sense that is applied in real-life solutions, taking full advantage of improving their environment for the benefit of acquiring healthy and educational knowledge that will serve them in obtaining good knowledge. Among the necessary technological resources used in student learning, social networks, web pages, and educational platforms prevail, which because of the health emergency presented gained relevance in all areas of the human being.

Conclusion

The support that parents give their children in school tasks and in the different activities that they carry out with their teachers, helps in the children's learning, this motivates them to continue and fulfil their activities as students; They must also have good links with the educational institution and the teachers, in this way the curriculum and the progress of their children are better understood, they help them feel more comfortable and satisfied with the quality of their education, motivating them to complete their studies. and continue them until they achieve the desired success as parents and themselves as future professionals

Acknowledgements

The authors thank the editors for allowing the paper to be published

References

Abelairas-Gómez, C., Carballo-Fazanes, A., Martínez-Isasi, S., López-García, S., Rico-Díaz, J., & Rodríguez-Núnez, A. (2020). Knowledge and attitudes on first aid and basic life support of pre-and elementary school teachers and parents. *Anales de Pediatría* (English Edition), 92(5), 268-276. https://doi.org/10.1016/j.anpede.2019.10.005

Álvarez Fernández, M. V. (2006). La escuela del paternalismo industrial asturiano (1880-1936). Colección Varia;

Arias, F. (2016). El Proyecto de Investigación: Guía para su elaboración (3º edicación). Caracas, Venezuela: Editorial Episteme.

Arias, F. G. (2017). El Proyecto de Investigación, 5ta Edición. Venezuela: Universidad Nacional Experimental Francisco de Miranda. (UNEFM).

Barnet-López, S. D. (2017). Construcción del registro de observación para el análisis del movimiento fundamentado en la teoría de Laban. *Revista de Ciencias del Ejercicio y la Salud*, 15(2), 1-21.

Bork, P., Holm, L., & Sander, C. (1994). The immunoglobulin fold: structural classification, sequence patterns and common core. *Journal of molecular biology*, 242(4), 309-320. https://doi.org/10.1006/jmbi.1994.1582

Bruner, J. (2016). El Proceso Mental del Aprendizaje. Madrid: Editorial Narcea.

Colmenares, A. (2018). Investigaicón-acción participativa: una metodología integradora del conocimiento y la acción. *Revista Latinoamericana de Educación*, *3*(1), 102-115.

- Dávila Newman, G. (2016). El razonamiento inductivo y deductivo dentro del proceso investigativo en ciencias experimentales y sociales. *Revista de Educación Laurus 12*. Caracas Venezuela. 180-205.
- Flores Rivera, L. D. (2016). El uso de herramientas en línea para fortalecer el aprendizaje autónomo de los estudiantes de la escuela de administración de empresas de la Pontificia Universidad Católica del Ecuador sede Ambato.
- Hänze, M., & Berger, R. (2007). Cooperative learning, motivational effects, and student characteristics: An experimental study comparing cooperative learning and direct instruction in 12th grade physics classes. *Learning and instruction*, 17(1), 29-41. https://doi.org/10.1016/j.learninstruc.2006.11.004
- Hayes, D. N. (2017). ICT and learning: Lessons from Australian classrooms. *Computers & Education*, 49, 385-395. Johnson, R. (2016). Estadística elemental, lo esencial (3ª ed). Thomson. ISBN 970-686-287-0.
- Landerl, K., & Kölle, C. (2009). Typical and atypical development of basic numerical skills in elementary school. *Journal of experimental child psychology*, 103(4), 546-565. https://doi.org/10.1016/j.jecp.2008.12.006
- Lin, Y. G., McKeachie, W. J., & Kim, Y. C. (2003). College student intrinsic and/or extrinsic motivation and learning. *Learning and individual differences*, 13(3), 251-258. https://doi.org/10.1016/S1041-6080(02)00092-4

Manrique Villavicencio, L. (2016). "El aprendizaje autónomo en la educación a distancia".

- Marinely, D., Arteaga, N. K., Vera, A., & Rivas, Y. (2022). Kichwa orality, past and present from the educational, anthropological and cultural perspective. *International Journal of Health Sciences*, 6(2), 577–587. https://doi.org/10.53730/ijhs.v6n2.7280
- Ministerio de Educación del Ecuador. (2019). Currículo de los niveles de educación obligatoria. Subnivel Elemental. Segunda Edición. Ecuador: Ministerio de Educación del Ecuador.
- Ministerio de Educación. (2016). Currículo de los Niveles de Educación Obligatoria. En Educación General Básica. Quito.
- Morales, O. A. (2017). Fundamentos de la Investigación Documental y Monografía. Mérida, Venezuela: Grupo Multidisciplinario de Investigación en Odontología, Facultad de Odontología, Universidad de Los Andes. pp.20 .

Navarro, R. E. (2017). En concepto de enseñanza aprendizaje. Editorial Red Científica.

Pérez, & Gardey. (2018). Definición de aprendizaje. Obtenido de https://definicion.de/aprendizaje/

Pérez, M. (2021). Definición de aprendizaje. https://conceptodefinicion.de/aprendizaje/

Polanco, J. M. (2017). Herramientas 2.0 aplicadas a la educación: Blog, Wikis, y Redes sociales.

- Ponce, E. E., & Rodríguez, M. (2020). La responsabilidad y el respeto como valores esenciales en el desarrollo emocional. Revista Atlante: Cuadernos de Educación y Desarrollo.
- Rhim, J., Lee, G. B., & Lee, J. H. (2020). Human moral reasoning types in autonomous vehicle moral dilemma: A cross-cultural comparison of Korea and Canada. *Computers in Human Behavior*, 102, 39-56. https://doi.org/10.1016/j.chb.2019.08.010
- Salazar, D. F. (2017). "La Autoestima y el Aprendizaje Autónomo de los estudiantes de séptimo año de eduación general básica de la Unidad Educativa Augusto Martínez del cantón Ambato".
- Sánchez, R. E., & Rodríguez, M. (2021). Information and communication technologies, their impact on the teaching-learning process. *International Research Journal of Management, IT and Social Sciences*, 9(1), 19-25. https://doi.org/10.21744/irjmis.v9n1.1981
- Schnotz, W., & Bannert, M. (2003). Construction and interference in learning from multiple representation. *Learning and instruction*, *13*(2), 141-156. https://doi.org/10.1016/S0959-4752(02)00017-8
- Sunde, M., Serpell, L. C., Bartlam, M., Fraser, P. E., Pepys, M. B., & Blake, C. C. (1997). Common core structure of amyloid fibrils by synchrotron X-ray diffraction. *Journal of molecular biology*, 273(3), 729-739. https://doi.org/10.1006/jmbi.1997.1348
- Thuneberg, H. M., Salmi, H. S., & Bogner, F. X. (2018). How creativity, autonomy and visual reasoning contribute to cognitive learning in a STEAM hands-on inquiry-based math module. *Thinking Skills and Creativity*, 29, 153-160. https://doi.org/10.1016/j.tsc.2018.07.003
- Valladares, I. (2016). Psicología del Aprendizaje. Ecuador: Universidad Técnica de Loja.
- Villanova, S. (2016). Concepciones acerca del aprendizaje: diseño y validación de un cuestionario para profesores en formación. *Revista electrónica de investigación educativa 9*(112), 6.
- Zaharija, G., Mladenović, S., & Boljat, I. (2013). Introducing basic programming concepts to elementary school children. *Procedia-social and behavioral sciences*, 106, 1576-1584. https://doi.org/10.1016/j.sbspro.2013.12.178