



Cognitive Development in School Performance in High School Students



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Abstract

The objective of this research is to determine the cognitive development in the school performance of the students of the upper basic of the fiscal educational institution "Santa Rita", of the Chone canton in the period 2021-2022. The applied methodology had an exploratory and descriptive quantitative-qualitative approach, taking the position of several authors and the opinion of directors and teachers of higher basic education; since they are the ones who guided the teaching-learning process of the students under their charge through various disciplines. When investigating teachers based on the survey carried out, it is evident that most of the respondents have followed the regulations and guidelines issued by the Ministry of Education through the districts with teaching through interdisciplinary projects and the implementation of a curriculum prioritized by the crisis experienced in the pandemic by Covid 19. The result was that teachers assumed the responsibility of bringing knowledge, but also becoming aware of the circumstances and motivation was permanently delivered so that students will take the right direction, being mostly the architects of their learning such as self-discipline, responsibility, and care. Teachers used this virtual teaching time, prioritized individual work and permanent self-assessment processes in school performance; Likewise, they enhanced cognitive development through learning techniques and strategies associated with the evaluation phases.

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1 Introduction

The research was carried out in the upper basic of the fiscal educational institution (IEF) "Santa Rita", of the Chone canton in the period 2021-2022, it is important because the reason of being in education is the student and their cognitive development, because their success in comprehensive training depends on this, making their skills and abilities serve their own learning. Cognitive development is all the processes through which the human being acquires skills that allow him to interpret reality and interact with it in an efficient way. Therefore, cognitive or cognitive development is understood as the evolution of intellectual capacities, of which intelligence is one of the most important [Hormaza & Sanchez \(2016\)](#); [Carpio & Garcia \(2017\)](#), giving an opinion in a study on the cognitive process, it is necessary to highlight that language is the mechanism that allows to make known, or express thought, it is not thought itself, even when language does not develop logical thought, it is a necessary condition for its development, in the formal period of its development. In this sense, without language, the frames of reference would be personal and would lack social regulation fostered by interaction, thanks to the latter, language extends logical thought to its optimal level.

Learning difficulties must be addressed within the scope of a chain of causes and consequences of social problems of school age, authors such as [Pereira \(2019\)](#), state that poor academic performance can trigger feelings of low self-esteem, as well as can negatively influence the student's future productivity, acceptance by peers and family members, as well as other activities related to the development process of children and other subsequent steps. These learning and behavioral difficulties can simultaneously increase the probability of the appearance of problems in social and school contexts, negatively interfere in students' interpersonal relationships, in their social adaptation and in their self-concept. According to the study by [Galaraga & Pereira \(2016\)](#), Piaget's theory of cognitive development is a complete theory that opines on the nature and development of human intelligence. Piaget (1896-1980) with his theoretical postulates expresses that, in childhood as a phase of development of the individual, he plays an important role in the intellectual processes of multiple intelligences, with what he is capable of learning in the context, and that the child learns through actively doing and exploring. The theory of intellectual development focuses on the perception, adaptation, and manipulation of the surrounding environment. It is mainly known as a theory of stages of development, but in fact it is about the nature of knowledge itself and how human beings gradually come to acquire, build, and use it. The cognitive development analyzed by [Gómez \(2017\)](#), recognizes that it is the process by which the human being acquires knowledge through learning and experience, where the knowledge they learn throughout life is related and how this process is affected through memory, language, perception, problem solving, and planning. It involves sophisticated and unique functions in each human being. This development is linked to the natural capacity that human beings must adapt and integrate into their environment. For the development of the research, the problem observed in the IEF of Santa Rita and the formulation and systematization of this is included, the antecedents of other investigations that are related to cognitive development and school performance are valued ([Casey et al., 2000](#); [Casey et al., 2005](#)).

2 Materials and Methods

The methodology used has a mixed approach; qualitative and quantitative, with the application of inductive and deductive, statistical, and bibliographical methods and field techniques: interview, survey, and observation guide, we worked with a population and sample of 60 people, the results are analyzed and interpreted and obtain the following conclusions and recommendations ([Brooks et al., 2002](#); [Walburg, 2014](#)).

3 Results and Discussions

In the fiscal educational institution "Santa Rita", of the Chone canton, the possibility of studying the cognitive processes in its students was observed, in such a way that a bibliographic review was carried out to consider what had been investigated in this regard in different fields. Therefore, defining cognitive development, also called cognitive as the evolution of the intellectual capacities that a person acquires during their development, can be corroborated in the research carried out by [Manzilla & Oiberman \(2017\)](#), where they considered the relevance of the intelligence. Jean Piaget, a prominent Swiss researcher in human behavior who made enduring contributions to the subject in the 20th century, posits that cognitive development begins from birth, with environmental factors and biological maturation processes.

It assumes that cognitive processes are progressively organized, in such a way that it is not possible to acquire the skills of a stage without having gone through the previous stage (Panadero et al., 2017; Ritchie & Dale, 2000).

Other authors such as Mar et al. (2017), stated that cognitive development responds to the innate need to relate and be part of society, associated with the natural ability to adapt and integrate, this is a characteristic of personality. that involves different disciplines. The student during his development develops skills, fundamentally develops his memory, learns to solve problems, language, perception, planning, all these are unique functions of the human being acquired and perfected since childhood. Cognitive development is the process by which a person acquires knowledge about what surrounds him and thus develops his intelligence and abilities, these begin from birth and continue during childhood and adolescence (Albornoz Zamora & del Carmen Guzmán, 2017). According to Piaget, cognitive development does not consist only of qualitative changes in facts and skills, but also in radical transformations of how knowledge is organized, once the child enters a new stage, he does not regress to an earlier form of reasoning. nor of operation (Balladares & Salinas, 2015).

School Performance School

performance or academic achievement, according to Barrios Gaxiola & Frías Armenta (2016) refers to any measure of a student's progress at the corresponding level in a school period or in a corresponding academic area. Academic results are evaluated with tests, grades, standardized test scores, or the enrollment of the entity as it is a quantifiable factor, performance is taken as a criterion to measure success or failure through a grading system of 0 to 10 in most public and private educational centers; therefore, the grades given, and the evaluation have to be an objective measure of the state of the students' achievements. On the student's school performance depends fundamentally on all the knowledge, they learn to learn. The objectives to reeducate as a fundamental element according to Navarro (2017), there are some elements that influence this process as can be seen in figure 1

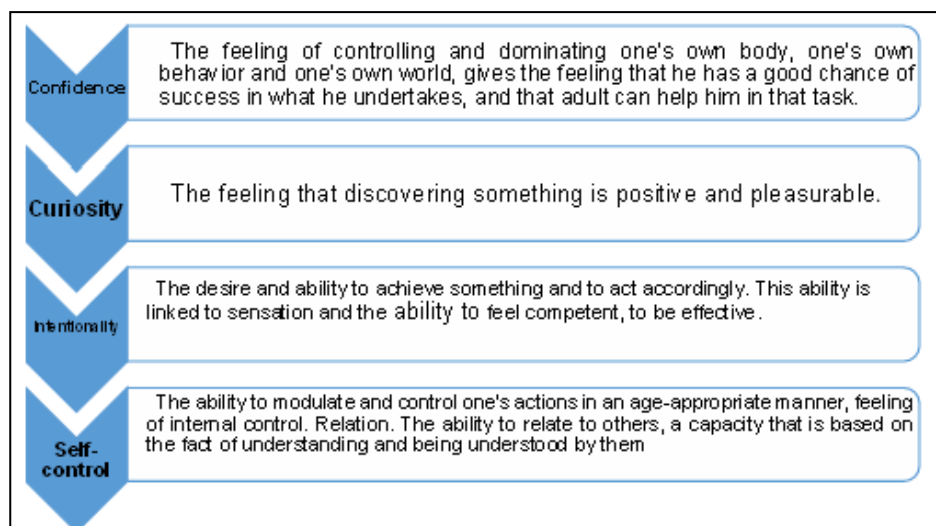


Figure 1. Elements that influence the cognitive process

Usually not only motivation, but also the performance in certain cognitive processes facilitates the design student and other similar careers the course of the degree training and their subsequent professional performance (Alvarez et al., 2015). Hence, aptitude tests are carried out based on this criterion. In this sense, it is interesting to investigate which of these processes could function as predictors of good academic performance during the degree. Cognitive processes constitute the system by which the brain handles reality and although they occur simultaneously and it is impossible to separate them functionally; for a better study of these, they have been divided according to methodological criteria. A proposed division separates them into elementary processes: such as memory, visuospatial skills, and attention; and more complex and superior processes such as the so-called executive functions, which constitute the processes of self-regulation of behavior and planning of actions. The evaluation of cognition is done hierarchically, from elementary processes to the most complex ones. Additionally, each process is evaluated in two relatively independent domains, the quality of the process and its processing speed.

The educator can organize the content of the curriculum and adjust his teaching methods according to the level of cognitive development of the student and his educational needs (García & Zambrano, 2016). If the activities you present to the child are adjusted to their previous knowledge, their motivation to perform the task will be much higher than if it is well above or below their skills. It is also encouraged that the student takes an active attitude during the learning process, in the old school, he was a mere receiver of information. Now it is intended to arouse the child's curiosity about the reality that surrounds him, that he investigates, that he learns to learn. The teacher becomes a guide for the student in this learning process, proposing new challenges and guaranteeing the strategies and resources so that he learns to learn. Martínez et al. (2020), states that school performance is one of the main variables in education and given its importance, it has been the subject of numerous investigations from various theoretical and methodological approaches. Its concept involves both variables that are associated with the student himself and others related to the environment. Thus, within the causal factors there are elements that can be attributed to both students and teachers, including motivational factors, those related to IQ and cognitive processes, as well as study methods and habits and pedagogical skills of the teacher.

School performance is a result of the school learning process, in which the effects of numerous social and personal variables and their interrelationships converge. Currently, academic records and school grades are used as the main source to assess the results of teaching and constitute the criteria to define school performance (Rayes Carreto et al., 2014). School performance and expresses that there are two theories that involve factors associated with academic performance that may originate in two large areas, personal determinants, and social determinants (Mello & Estrada, 2020). In the first of them are included: intelligence, aptitudes, class attendance and others, in the second, family environment, socioeconomic context, demographic variables and parental education, coinciding with, Mello & Estrada (2020), who state that the variables related to academic performance can be internal or external, understanding the internal ones as the personal characteristics of the student and the external ones as factors of the context. The school context and the social or family context are connected to each other, so that the interventions made to improve the proper functioning in one of them will have repercussions in the other (Vescio et al., 2008; Maba, 2017).

In the case of students exposed to risk factors, the symbiosis between the pedagogical and the social cannot be ignored and the development of intervention programs must take both aspects into account Rodríguez & Guzmán (2019), this means accepting a responsibility shared. In this sense, the school continues to be, without a doubt, the most appropriate means to validate initial inequalities and to contribute to equal opportunities in academic results. Families can be reached through educational centers, which is a way of uniting the social and the educational. Likewise, from the centers, interventions can and should be carried out that contribute to strengthening the personal variables that have been shown to be capable of influencing the reduction of the gap in the performance of students exposed to risk factors. This is relevant if students are to become active subjects in relation to their performance, and self-protective from the risk factors resulting from their contexts (Maba et al., 2017; Postareff et al., 2007).

Student performance has become one of the essential variables in the analysis of education and the quality of any academic offer. However, pedagogical research has circumvented studies of academic performance, placing its attention indistinctly on the process or on the result, but with an emphasis on the estimation of learning (Krüger, 2016). The analysis that is presented exposes the criteria associated with the influence of the different factors that intervene in academic performance and the importance of knowing these processes within the framework of the educational strategies that must be developed in the pedagogical process and in the classroom.

Evaluation process in cognitive development and school performance

Cognitive processes in the human being allow the collection of information so that at a certain moment it can be processed, stored and retrieved the information obtained through the senses and used when necessary, this facilitates learning, Castillo Mina & García Macías (2021), in this regard believes that At present, cognitive processes are of vital importance for all those involved in education; since it affects the behavior of students, it appears and is seen to emerge in the processes of social adaptation and survival, and for this reason teachers stimulate the development of mental processes. On the other hand, the intelligences that are activated through cognitive processes also play an important role, the same ones that are awakened with the strategies that the teacher plans in his praxis to promote educational development in students. Cognitive processes are its divisions, they appear from the basics and consist of processing the information captured by our senses, staying attentive to the different stimuli that will benefit their learning and also being able to store the information for the necessary moment. The superiors that allow a broader look at the performance of the different tasks, the individual manages to elaborate value judgments, also manages the behavior

and the set of cognitive processes, helps individuals to communicate with their peers and adults and finally allows the elaboration of innovative ideas this will depend on the intrinsic motivation that you have when performing a task.

These learning processes are not those concepts in which the teacher only transmitted knowledge while the students were mere reproducers of the information imparted. Learning is conceived as an internal process in which the student builds, modifies, enriches, and diversifies his knowledge schemes, currently the student is already an active part of his own learning, he is able to make a judgment and reflect on what has been exposed by the teacher, since this becomes a guide. The research based its methodology on the particularity of the quantitative-qualitative approach. Of an exploratory and descriptive type, because it allowed to describe and determine the cognitive development in the school performance of the students of the upper basic of the Santa Rita educational institution of the city of Chone in the 2021-2022 academic period. The population and total sample were considered in the 60 students of the upper basic; 1 director, 9 teachers who are in charge of different subjects at this upper basic level and the parents who participate in the research project. A class observation guide, an online survey or test was designed for teachers because they are the ones who permanently carry out the evaluation process in classes, and through them recognize the results of these in the study variables. , and an interview with the directors, the inductive and deductive, bibliographic and statistical methods were applied. For the validation of the instruments, an online analysis was carried out with 4 experts who issued favorable judgments approving the instruments, which contained the parameters with criteria of quality, validity, reliability. Figure 2 shows the consultation related to the resources used to determine cognitive development.

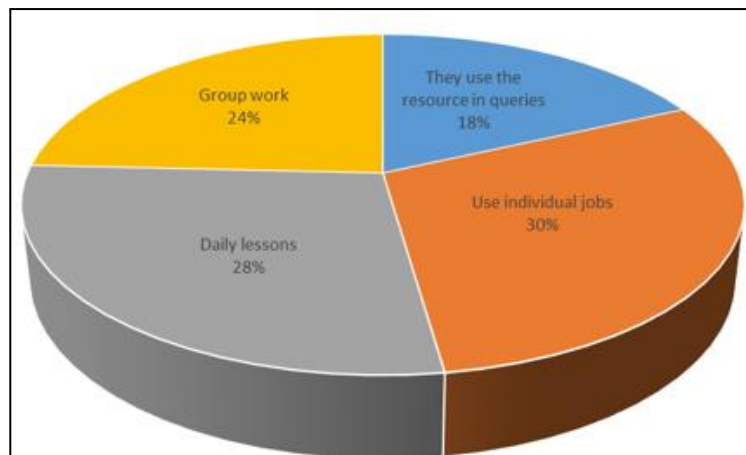


Figure 2. Resources to determine the cognitive development of their students

According to the results, it is observed that teachers respond that they use the resource of consultations; they use individual jobs to give everyone equal opportunities in their performance and in the time they require; since some learn slower and others faster to enhance learning; In addition, they use the daily lessons to always activate the learning and they use the group work so that they are enriched with the knowledge of each one. It is concluded that it is important to create the evaluation criteria and make them known in the analysis so that students with their abilities can meet and with this attend to individual differences. In this regard, he states [Rodríguez \(2020\)](#), based on the study by [Rugeles, et al. \(2013\)](#), as the ability that students develop to learn autonomously, actively and participatively, in this way they acquire knowledge, as well as they also acquire knowledge, skills and values in the self-formation of the subject. facilitates the virtual student the development of their ability to demand themselves, thus, it involves them in decision-making such as the distribution of times, the location of spaces, the sources of consultation among which databases can be mentioned. of specialized virtual data both free and licensed, blogs, academic networks. Teachers respond that they agree, despite the fact that there are some who do not agree. As expressed in a study on the evaluation processes of [Justo Contreras \(2020\)](#), who based on an investigation regarding the questionnaire, where he states that they are valuable resources to know everything about a case, for [Hernández et al. \(2017\)](#) the questionnaires are a carefully prepared set of situations and aspects of interest for the survey, which will be answered by the sample, they also maintain that content validity is understood as the degree to which the instrument measures what it initially intended to measure. [Soto \(2015\)](#) stated about the validity of the evaluation instrument developed because it is valid and measures what is to be measured, this questionnaire resource is a very valuable tool to use in school performance processes. The way to make visible in an effective way to develop the cognitive process that is reflected in school performance, shown in figure 3, was investigated.

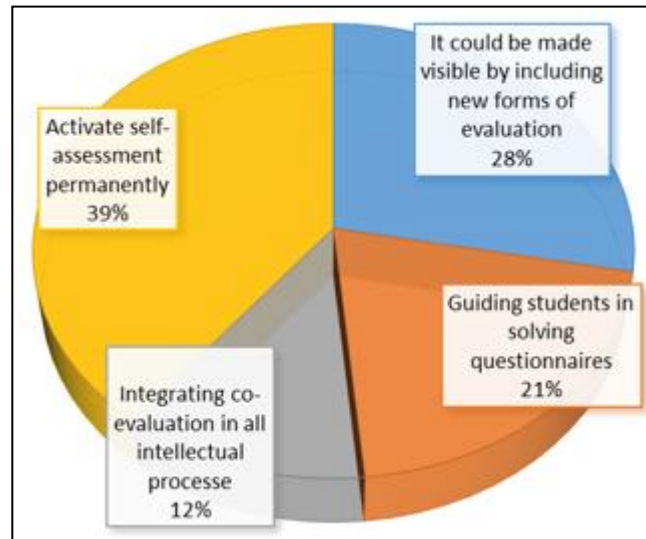


Figure 3. Way to make visible in an effective way to develop the cognitive process

According to the results obtained, 28% of teachers respond that it could be made visible by including new forms of evaluation, 21% of teachers respond that, guiding students in solving easy questionnaires, while 39% of teachers respond that, integrating co-evaluation in all intellectual processes, and 12% of teachers respond that co-evaluation should be activated in all processes. In this regard, it is evident, according to the highest percentage answered by teachers, that it is essential to train students, activate self-assessment permanently in the evaluation process of learning. As stated in this context [Navarro Mosquera \(2017\)](#), each student uses their own set of strategies to acquire a given knowledge, so self-assessment will allow them to take giant steps in learning. According to the objective proposed in the student's study, the expected results are measured, where all students learn differently, with their own rhythms and tools. Teachers are sometimes faced with students who, without having disabilities of any kind, develop skills and abilities slowly, while others manage to master the skills and put them into practice quickly. These differences are the result of age, ability to concentrate, motivation, environment, parental support, use of technology; they are the result of their biological, psychological, and social development. That is why it is appropriate to involve self-assessment to strengthen cognitive development and obtain optimal school performance.

In relation to the stated objectives, it was possible to identify that the educational institution at the upper basic level, have in their pedagogical model as evaluative resources, use evaluation techniques permanently, integrating the student to determine their own evaluation and at that moment proceed to provide feedback on each phase, considering that this research was carried out in the virtual period. It should be made known that students can advance from their homes with the guidance of the platform and on digital devices. Teachers consider the evaluation of learning in moments of virtual teaching interesting, these are supported by the research of [Alomia Martinez & Dominguez Pretel \(2021\)](#), who cites [Black & William \(1998, 2009\)](#); [William \(2011\)](#), as references; since, they allow to analyze the evolution of the studies in this field and verify the progress in the development of the conception of the evaluation.

Reviewing other authors that feedback should be given, [Bennett \(2011\)](#); [Alomia Martinez & Dominguez Pretel \(2021\)](#), thinks of the evaluation of school performance through formative evaluation and raises the need for the theory of action to achieve an improvement in student learning, not only to review work that has already been completed, detect and correct errors or point out successes, but also to guide, accompany and motivate students in their subsequent learning. According to [Ormaza \(2021\)](#), he expresses that in Ecuador, since 2016 a new curriculum was implemented and according to what was mentioned by [Herrera & Cochancela \(2020\)](#), this establishes the horizon that students must reach from work in the different areas of learning present in the curricular proposal, being the initial place that allows the teacher to develop their educational praxis with the best methodologies and better learning in the classrooms, in virtual reality the management facilities of the platform allow keynote talks and the students participate with questions and answers, but it is evident that the presence is needed to provide personalized teaching, however at other times of feedback the information is delivered by WhatsApp to resolve the tasks or other concerns.

At present it is also necessary to say that many students showed apathy, failure and disinterest at the time of classes, which makes it necessary to strengthen the educational process with new strategies and methodological techniques so

that school performance is fruitful. The evaluation processes that are being implemented in the educational institution "Santa Rita" with respect to the determination of the cognitive development and the school performance of the students are planned to be executed permanently, with the learning cycle, this works as stimuli by student outcomes; since, at the time of self-assessment, they recognize their successes and failures with the responsibility of taking them as part of the learning in self-assessment, co-assessment and hetero-assessment as training processes to cement learning and decision-making to move forward.

4 Conclusion

Teachers, to have the correct information on the teaching-learning process, to demonstrate cognitive development in school performance, used all the moments of evaluation and with great relevance the individual tasks since they were separated and the cost of the internet in several places did not come with intensity, which made it difficult to form group work, these jobs were supplied at home with their relatives. The educational institution "Santa Rita" with the learning community, fully agreed that the results in the school performance of their students be validated through questionnaires prepared virtually and within the regulations indicated in the districts and circuits of the Chone canton. In such a way that confidence and security in health were provided so that the development of cognition, skills and abilities planned in interdisciplinary projects will be reflected in the evaluation instrument or virtual questionnaire (Berlinski et al., 2009; Meyer, 1997).

Conflict of interest statement

The authors declared that they have no competing interests.

Statement of authorship

The authors have a responsibility for the conception and design of the study. The authors have approved the final article.

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