



Diagnostic Evaluation for Strengthening the Teaching-Learning Process



Gabriela Maricela Sánchez Hidrovo ^a

Martha Elizabeth Mendoza Macías ^b

Katy Yadira Pinargote Baque ^c

Cristina Alexandra Escobar Valdez ^d

Article history:

Submitted: 09 March 2020

Revised: 27 April 2020

Accepted: 18 May 2020

Keywords:

diagnostic evaluation;

prior knowledge;

process evaluation;

significant learning;

teaching-learning;

Abstract

In this research, which aims to identify the application of diagnostic evaluation to strengthen the teaching-learning process in students. He focused on the diagnostic evaluation and what is the correct way to perform it, to strengthen the teaching-learning process by improving the techniques and methods that are used to achieve positive results in this process, concluding that teacher training is very important for the application of the instruments that facilitate the taking of the diagnostic test, however, have not been trained. The study has been an exploratory type with a quantitative approach, using scientific, analytical, and synthetic methods. To base the research, the bibliographic method was used and as a study technique the survey was used, in which questions were formulated according to the study variables. The results guide the improvement of students' cognitive meta strategies and guide both teaching and their school learning.

International research journal of engineering, IT & scientific research © 2020.

This is an open access article under the CC BY-NC-ND license

(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Corresponding author:

Gabriela Maricela Sánchez Hidrovo,

Pontificia Universidad Católica del Ecuador sede Manabí, Ecuador.

Email address: gsanchez1651@pucem.edu.ec

^a Pontificia Universidad Católica del Ecuador sede Manabí, Ecuador

^b Pontificia Universidad Católica del Ecuador sede Manabí, Ecuador

^c Pontificia Universidad Católica del Ecuador sede Manabí, Ecuador

^d Pontificia Universidad Católica del Ecuador sede Manabí, Ecuador

1 Introduction

The present work aims to identify the application of diagnostic evaluation to strengthen the teaching-learning process, in which the capacity was expressed that teachers have to correctly access the diagnostic evaluation and in turn perform it in a way where there are no errors to complete the development of it. At the global level, education continues to undergo important changes in the processes of development of educational models, whose fundamental purpose is to achieve effective and meaningful learning in students. In the international sphere, according to studies carried out, the main factors that influence student learning are manifested by the alterations and disorders, terms that, up to the present moment, have been treated interchangeably. At the Ibero-American level, the diagnostic evaluation is performed in a standard way to see the development that students have, in some institutions it is done at the beginning, in others at the middle of the school year and other quarterly ones each will depend on the ability to evaluate and know the abilities of their students.

This fact highlights the claim of our socio-educational reality in the Caribbean in terms of the implementation of activities focused on the teaching-learning process with an intervention purpose for improvement and change: the educational or pedagogical diagnosis It may be the answer (Arriaga, 2015).

In the Republic of Ecuador, studies have shown countless difficulties in student learning, a situation that is evidenced in the so-called diagnostic tests that are performed at the beginning of each year. However, the lack of a diagnostic evaluation model, the existence of indicators and instruments for assessing student learning achievements, constitute a factor that causes poor school performance and this in turn the continuing failures they face in every school year (Cappelleri *et al.*, 1999; Heinonen *et al.*, 1996). According to UNESCO, Ecuador is one of the Latin American countries still considered to have low academic performance and this in turn reflects a society immersed in economic and social crises. This indicates that although they have made attempts to improve, they still do not respond effectively to the pedagogical requirements of today's world.

One of the weaknesses that are still facing in Ecuador is the absence of a school evaluation system, as a means of accountability for the lack of vigilance and corporate participation of citizens around the education their children receive. In Manabí in the different districts the diagnostic evaluation is applied in a way that strengthens the first teaching steps towards the students. But this evaluation will be done in the right way and if it is done in the right way because there are so many students with Special Educational Needs. "These tests constitute the basis for teacher planning and allow them to know the group of students, their shortcomings and strengths" (El Comercio, 2018). Each student arrives at educational institutions with a set of previous knowledge and knowledge, which are based on lived experiences, according to the socio-cultural and family environment in which they live, and conditioned by their characteristics and contexts. Each of these experiences constitutes the basic value of any learning. For the above, according to (Bombelli & Bomberis, 2012) (as cited in Zavala, 1993)

Teachers should consider the diversity of the learning processes they must face, and therefore, the need for their processes of teaching, and especially the evaluative ones, not only contemplate such diversity but also take them as the backbone of their educational practices.

The present study seeks to reflect, mainly, on the challenges that are presented to the teacher when planning their classes for the school year, when they are in charge of elective or interdisciplinary subjects, and with the different groups of students belonging to different communities. And also about the degree of theoretical and practical lack of knowledge about the evaluation of learning that some medium level teachers have. The purpose of the Diagnostic Evaluation tests is not to measure gross content acquisition rates, but to establish a graduated scale of levels that allow knowing the evolution of student performance and its relationship with current requirements, seeking an optimal level of development of competencies for its application to contexts other than educational.

2 Materials and Methods

The study has been exploratory with a quantitative approach, using scientific, analytical, and synthetic methods. The information was obtained which was systematized statistically and then analyzed and interpreted in the light of the advances of science. To base the research, the bibliographic method was used to analyze the credited sources that allowed us to deepen the research variables scientifically. As a study technique, the survey was used, in which

questions were formulated according to the study variables, which were applied to a population and shows at the same time 18 teachers, the bibliographic reference that supports the research (Hernández *et al.*, 2010).

3 Results and Discussions

3.1 Diagnostic assessment Diagnostic

Assessment is the instrument that allows students to recognize the skills and knowledge acquired during each stage of the study. "The evaluation is the collection of useful information to make decisions that facilitate and improve learning" (Henaó, 2016).

The educational diagnosis guides the intervention of the teacher in different aspects; for example, as for the time you will devote to the topics; in a word, to teaching practice. This didactic decision making (diagnostic evaluation) bets on a better achievement of students' competences and strengthen their learning process (Bombelli & Bomberis, 2012). The evaluation must be understood as an instrument of adjustment and didactic resource that is integrated into the teaching and learning process itself.

What is intended to be achieved with the diagnostic evaluation is the appropriate intervention of the teaching profession to take their classes in a more orderly way, knowing what the needs of their students are and thus being able to cover in the best way the weaknesses that were found in them. "Identify the different levels of performance that students have in each grade, generate hypotheses of difficulties in understanding some knowledge and provide educational material for the classroom and teacher training" (Ministry of Education of Ecuador, 2013). For this reason, the diagnostic evaluation process will be accompanied by the teacher towards the student to carry out most professionally the adaptation of the different areas that are intended to be improved, achieving the correct teaching process.

Evaluation is seen as repression or accountability, it is not comprehensive, it is evaluated in the manner of qualifying students. In this type of evaluation there are multiple-choice questions that correspond to the modules of initial and intermediate level (primary) and advanced level. According to Henaó (2016), the diagnostic evaluation is a systematic and rigorous process that is done at the beginning of a school year, a subject, or an academic period. It seeks two objectives: first, to understand what state the students are at the beginning of the year, the topic or the period; and second, to make decisions that facilitate and improve learning during the development of the educational process. These two objectives apply to three aspects:

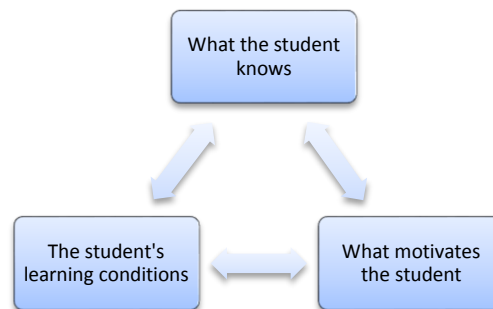


Figure 1. Aspects of the diagnostic evaluation

In Figure 1 it is mentioned what are the aspects of the diagnostic evaluation where it is mentioned that it is what the student knows is to say with the cognitive resources that count in those moments, which motivates the student to learn and finally what are the conditions that the student has to undertake the cognitive processes required by said evaluation. Then we consider the diagnostic evaluation as a process in which the student group will be linked with the teachers to address promptly the weaknesses they have and thus be able to collaborate in the proper use of the evaluation. Manifests (Henaó, 2016). The diagnostic evaluation is a systematic and rigorous process that makes the beginning of a school year, a theme, or an academic period. It seeks two objectives: first, to understand what state the

students are at the beginning of the year, the topic or the period; and second, to make decisions that facilitate and improve learning during the development of the educational process.

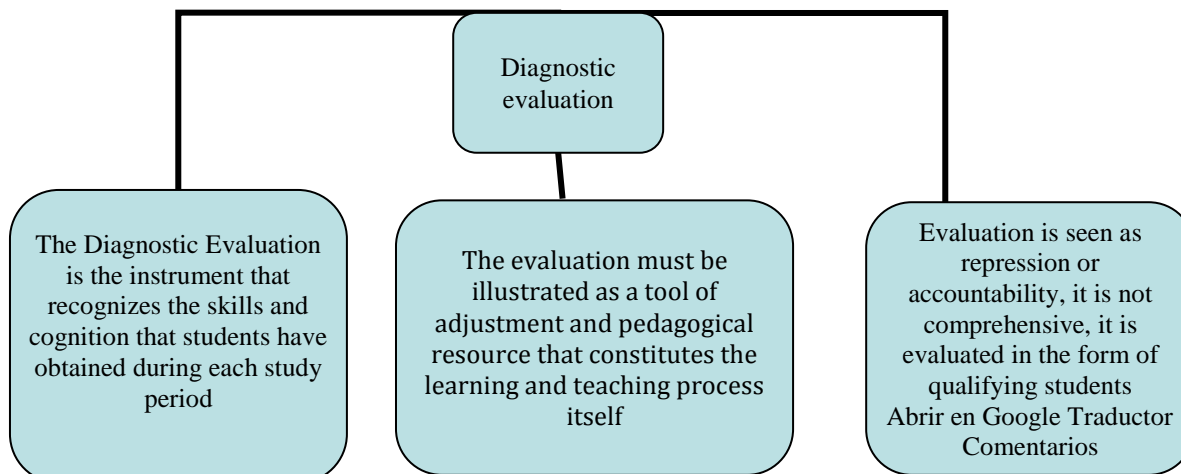


Figure 2. *Diagnostic evaluation*

In figure number 2 it is mentioned that it is the diagnostic evaluation and what is wanted to be achieved with this, to achieve the objective of improving the quality of learning the teacher must have the ability to place the students according to the level that required based on the results of the diagnostic evaluation, it is always good to perform a diagnostic evaluation when one chooses a group of new students so that they can observe practically the resources that will be needed so that the students can handle the classes in a more compact way that will occur during the school year. The diagnostic evaluation is a main part of the educational centers since it is here that it is very important to know the starting point that our students have and that is why it is very important to achieve the truthfulness of the teaching-learning process.

At the beginning of the school year, it is associated with a time of diagnostic evaluations, where most of those involved in education are activated towards the determination of the levels of prior knowledge presented by our students; especially to know how much they know about our subject or the subjects that the curriculum prescribes for us, this at any educational level (Cruz, 2014; Ozuru et al., 2009; Schauble, 1990; Britton & Tesser, 1982). The student when entering a new educational cycle tends to grow a little by the diagnostic evaluation as it will put into practice if what they learned in the previous school year gave the favorable results for this new cycle, so it is recommended that the teacher knows how to take The best way is the diagnostic evaluation although it is not qualified if it helps the teacher to achieve the objectives that he intends to achieve with the students during that year and also be able to adapt them to the corresponding educational level.

3.2 *Strengthening of the teaching-learning process*

For the improvement of educational quality, planning is required for pedagogical support that allows the student who has learning problems to strengthen their knowledge. Experts affirm that any improvement process is only significant if it implies a change in pedagogical practices for the development of activities within the classroom. At present, what is sought is that students be active agents and transformers of their knowledge (Alcivar et al., 2020; Rao et al., 2011; Chamoso et al., 2012; Rao et al., 2012). To comply with the above, professionals in education are required to promote the construction of new knowledge, that is, a teacher who communicates and encourages educational practice through pedagogical interaction.

However, these proposals have been difficult to implement, since the reality shows a frequent problem in the development of pedagogical sessions where teachers use a more expository methodology with a minimum participation of their students: the mitigated monologue. Teaching implies that teachers adopt methodologies, techniques, and tools as a complementary part for the development of meaningful student learning, thus fulfilling the function of integral academic and social training.

Many investigations have shown that the lack of updating of teachers for the use of pedagogical, didactic, didactic and technological strategies, is a permanent obstacle for students to acquire significant learning, which

according to (Sansevero *et al.*, 2006) (as cited in Ausubel, 2006), "is the human mechanism, par excellence, to acquire and store the immense amount of ideas and information represented in any field of knowledge." However, the current process of educational change, which is experienced in the country, means that teachers have the mission to update themselves with methods, teaching techniques according to technological progress,

3.3 Meaningful learning

Nowadays psychology explains how it is produced and how cognition is facilitated for the development of thought. In this way the theory of meaningful learning is born. According to Ausebel (1976), "educational psychology must concentrate on the nature and facilitation of learning the subject matter of study" (p. 18).

Learning is taken as a change of behavior that the individual demonstrates in the course of life, it is the process through which the skills, abilities, values among other aspects, which are the result of the study, are acquired and modified. This is associated with the environment where the learner develops. Learning is the "Set of processes of change and improvement that will be developed in the subjects as a result of their active involvement in formal and / or non-formal educational situations and opportunities" (Escamilla & Lagare, 2006).

From another perspective the work of (Moreira & Masini, 1982), is analyzed, with which it was possible to know that:

"Meaningful learning as an underlying concept to subsumers, assimilation schemes, internalization of instruments and signs, personal constructs and mental models, shared meanings, and constructive integration of thoughts, feelings, and actions." (p. 1)

The statement by the author indicates that meaningful learning contributes to the development of thought, which implies that new ideas, concepts, and propositions that are provided to the student can be learned significantly to the extent that others Images, symbols, concepts, ideas or appreciable propositions are adequately clear and available in the mental structure of the child where new information can interact for its development. The acquisition of new information depends to a large degree on the relevant ideas that already exist in the cognitive structure and the significant learning of human beings occurs through an interaction of the new information with the relevant ideas that already exist in the cognitive structure (Ausebel, 1976).

The teaching process needs to take into consideration that three indicators correspond to the work of educating students and these are teachers with their way of teaching, the school curriculum that allows guidance the knowledge of the individual through the programmed activities, according to Ausubel in your theory to meaningful learning as the human mechanism par excellence, which allows to acquire and store the immense amount of ideas and information represented in any field of knowledge (Tobón, 2006). It is very important to sensitize the students, orienting them so that have an adequate disposition to the construction, development, and strengthening of competences, forming and reinforcing values, attitudes, and norms, as well as a motivational state, appropriate to the task for the development of adequate meaningful learning.

3.4 Learning disabilities

Considering that education is not an obligation, but an opportunity to reach success is essential to know the steps and developments that reach the child as time passes. According to several philosophers and pedagogues, they say that at a certain age children become aware of the real world since based on the experiences and information gathered in different socio-educational fields, the degree of difficulty influencing student learning has been measured.

Learning problems arise due to how the brain incorporates and processes the information received. Thus, some people learn very differently from others. The important thing about this is to know how to learn better. For many fathers and mothers, they find it difficult to receive the news that their children suffer from a learning disorder, for most, it can be frustrating. It is very possible to feel different from others; but the truth is that learning problems are quite frequent in the educational environment.

Given these problematic situations, it is currently important that the entire educational community work together with the social worker since at this age many factors intervene so that the student's learning problems range from the personal to the socio-cultural and socio-economic, emphasizing that the educational engine is based from home. According to Lázaro *et al.* (2007), Social Work "is a profession of help whose objective is to attend people who go through difficult situations ranging from disorientation or misinformation to marginalization or social exclusion" (p. 19). When the work is carried out with the neediest, exploited and marginalized, the work to be carried out implies an implication and a certain insertion in the world of the excluded. And this implies personal and professional life

because it breaks what are considered the guidelines of normality, of politically correct professional work (Ander, 2012).

The problems presented in the educational context are diverse, at the discretion of (Muñoz, 2012):

One of the biggest demands is regarding the learning situations and others that allude to social issues that are evident there, and it is in these situations where teachers express that they are without tools, without theoretical or methodological support to face the different situations that arise.

3.5 Teaching-learning techniques and strategies

The most important gift we have is the ability to learn new forms of behavior that allow us to face the ever-changing circumstances of life. Hence the importance of using the techniques and strategies to learn is presented as an alternative to learn and face several challenges of those presented in school. Strategic learning, in the expression of the authors of the book, is shaping a new culture of learning, more adjusted to the complex needs of today's world, which demand to learn strategies, which enable them to continue learning, a requirement that undoubtedly transcends the old informative schemes of the school.

Learning strategies allow us to activate the process of learning to learn” and enhance meaningful learning and problem-solving problems. At the discretion of Herrera & Lorenzo (2009) “these are given by the one that encompasses those cognitive resources that the student uses when facing learning” (p. 1). On the other hand the didactic techniques are ways, procedures, or systematized means that serve to organize and develop the activity of a group based on knowledge provided by the theory of group dynamics.

The teacher is the key figure of the teaching, considered this as a component of the educational process that involves the dynamic, conscious and valid relationship between teacher, times, knowledge, resources, students, methods, techniques and tactics, assessments, and improvements. Teaching that can be given directly, when the teacher imposes and directs the action to be developed by the student and, indirectly, when the teacher, in an act of detachment of his knowledge and experiences, generates the participation of the students, solicits their opinions, motivates the discussion, promotes research and critical reflection of what it is about teaching and learning.

The strategic learning and teaching techniques in ideas of the aforementioned authors are shaped by a new learning culture, which adjusts to the learning needs of globalization and industrialization, which demand strategic learning, which allows students to continue to learn for their socio-work performance. In table 1, the results of the question are presented, obtaining the following results 88.89%, said they always apply the diagnostic evaluation; and 11.11% said they sometimes apply it and 0.00% never apply it.

Table 1
Frequency of application of diagnostic evaluation

Option	Alternative	Frequency	Percentage (%)
A	Always	16	88.89
B	Sometimes	2	11.11
C	Never	0	0.00
	Total	18	100%

These results show that the majority of teachers consider the application of diagnostic evaluation to be important in the teaching process and apply it to their students to identify their previous knowledge.

Table 2
Planning and prior approval of the diagnostic evaluation

Option	Alternative	Frequency	Percentage (%)
A	Totally agree	15	83.33
B	Agree	3	16.67
	Total	18	100

In table 3, the results are presented in which 83.33% of respondents responded that they fully agree and 16, 67% agree with the importance of planning and approving diagnostic evaluations. The teachers surveyed consider that the

diagnostic evaluations must be planned and previously approved, in this way a much stronger instrument can be generated. In the questions or premises embodied in it, you can acquire the shortcomings and strengths for subsequent classes that will be imported into the group. Table 3 shows the results of the question, obtaining the following results. By asking teachers that if the application of the diagnostic test is established as a requirement in the education system, which confirms that 77.78% agree "Totally agree"; and "Agree", 22.22%.

Table 3
The diagnostic test as a requirement in the education system

Option	Alternative	Frequency	Percentage (%)
A	Totally agree	14	77.78
B	Agree	4	22.22
	Total	18	100%

In theory and according to experience teachers understand diagnostic evaluation as mandatory according to the national education system. It is considered an important practice among the educational community to know the reality of the classroom. Analysis of the results in table 4, the results of the question "training on how to perform diagnostic evaluation" are presented, obtaining the following results: 66.67; "Totally disagree", 22.22%; "OK", 11.11%.

Table 4
Training on diagnostic evaluation

Option	Alternative	Frequency	Percentage (%)
A	Strongly agree	2	11.11
B	Agree	4	22.22
D	Strongly disagree	12	66.67
	Total		100%

This shows that teachers have not received training on how to conduct assessments diagnostics and only one monastery agrees with this question. In this sense we can consider that although the diagnosis is considered mandatory, the teachers themselves are not being trained, and therefore this could make updates on the subject difficult. According to the literature consulted, the purpose of the Diagnostic Evaluation tests is not to measure gross content acquisition rates, but to establish a graduated scale of levels that will allow us to know the evolution of student performance and its relationship with current requirements, looking for an optimal level of competence development for its application to contexts other than educational.

4 Conclusion

For teachers the diagnostic evaluation is established as a requirement in the educational system and is not the same test used to evaluate the student and therefore this grade is not considered as partial qualification, it is necessary to apply it in the educational system to determine the knowledge that students have acquired in previous years; For this reason, they always apply, but consider that the deficiency diagnostic evaluation of learning, is mainly due to the lack of evaluation criteria and indicators, well it should be preplanned and approved by the academic vice-chancellor.

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.

Acknowledgments

We are grateful to two anonymous reviewers for their valuable comments on the earlier version of this paper.

References

- Alcivar, C. M. M., Quimi, T. L. I., & Barberan, M. F. Z. (2020). The motivation and its importance in the teaching-learning process. *International Research Journal of Management, IT and Social Sciences*, 7(1), 138-144. <https://doi.org/10.21744/irjmis.v7n1.832>
- Ander, E. (2012). The scientific attitude as a lifestyle. *UPTAEB*, 16(12), 149-164.
- Anderson, R. C., & Ausubel, D. P. (2006). Readings in the psychology of cognition. Holt, Rinehart and Winston, 1965. *Original from the University of Michigan Digitized Jun*, 13, 13.
- Arriaga, M. (2015). Educational diagnosis is an important tool to raise the quality of education in the hands of teachers. *Athens*, 3(31), 63-74.
- Ausebel, D. (1976). *Educational Psychology: a cognitive point of view*. Madrid: Red Point.
- Bombelli, E., & Bomberis, J. (2012). Importance of diagnostic evaluation in higher level subjects in Pre-University knowledge. *GPT People Management and Technology Magazine / Issue No. 13*.
- Britton, B. K., & Tesser, A. (1982). Effects of prior knowledge on use of cognitive capacity in three complex cognitive tasks. *Journal of verbal learning and verbal behavior*, 21(4), 421-436. [https://doi.org/10.1016/S0022-5371\(82\)90709-5](https://doi.org/10.1016/S0022-5371(82)90709-5)
- Cappelleri, J. C., Rosen, R. C., Smith, M. D., Mishra, A., & Osterloh, I. H. (1999). Diagnostic evaluation of the erectile function domain of the International Index of Erectile Function. *Urology*, 54(2), 346-351. [https://doi.org/10.1016/S0090-4295\(99\)00099-0](https://doi.org/10.1016/S0090-4295(99)00099-0)
- Chamoso, J. M., Cáceres, M. J., & Azcárate, P. (2012). Reflection on the teaching-learning process in the initial training of teachers. Characterization of the issues on which pre-service mathematics teachers reflect. *Teaching and Teacher Education*, 28(2), 154-164. <https://doi.org/10.1016/j.tate.2011.08.003>
- Cruz, R. (2014). *The importance of diagnostic evaluation in education*.
- El Comercio. (2018). Trade. *Diagnostic tests to start the year*.
- Escamilla, A; Lagare, AR. (2006). The LOE: Pedagogical and historical perspective. *Glossary of essential terms*. Barcelona: Graó.
- Heinonen, S., Ryyänen, M., Kirkinen, P., & Saarikoski, S. (1996). Perinatal diagnostic evaluation of velamentous umbilical cord insertion: clinical, Doppler, and ultrasonic findings. *Obstetrics & Gynecology*, 87(1), 112-117. [https://doi.org/10.1016/0029-7844\(95\)00339-8](https://doi.org/10.1016/0029-7844(95)00339-8)
- Henao, J. (2016). *What is the diagnostic evaluation and how it works*. Accessed on December 10, 2019,
- Hernández, S., Fernández, C., & Baptista, L. (2010). Investigation methodology. Mexico City: McGraw-Hill.
- Herrera, L., & Lorenzo, O. (2009). Learning strategies in university students. A contribution to the construction of the European Higher Education Area. *Innovation and educational experiences*, 12(3), 1-14.
- Lázaro, S., Rubio, E., Juárez, A., & Martín, JP (2007). *Learning the Practice of Social Work*. Madrid, Kingdom of Spain: RB Servicios Editoriales, SL
- Ministry of Education of Ecuador. (2013). *Diagnostic evaluation*.
- Moreira, MA, & Masini, EA (1982). Meaningful apprenticeship: a theory of apprenticeship by David Ausubel. São Paulo
- Muñoz, C. (2012). Three fundamental problems of the education system. *Educational profiles*, 34,154-159.
- Ozuru, Y., Dempsey, K., & McNamara, D. S. (2009). Prior knowledge, reading skill, and text cohesion in the comprehension of science texts. *Learning and instruction*, 19(3), 228-242. <https://doi.org/10.1016/j.learninstruc.2008.04.003>
- Rao, R. V., Savsani, V. J., & Vakharia, D. P. (2011). Teaching-learning-based optimization: a novel method for constrained mechanical design optimization problems. *Computer-Aided Design*, 43(3), 303-315. <https://doi.org/10.1016/j.cad.2010.12.015>
- Rao, R. V., Savsani, V. J., & Vakharia, D. P. (2012). Teaching-learning-based optimization: an optimization method for continuous non-linear large scale problems. *Information sciences*, 183(1), 1-15. <https://doi.org/10.1016/j.ins.2011.08.006>
- Sansevero, I., Lúquez, P., & Fernández, O. (2006). Significant learning strategies for the internalization of national identity values in the. *Laurus*, 12(22), 273-300.
- Schauble, L. (1990). Belief revision in children: The role of prior knowledge and strategies for generating evidence. *Journal of experimental child psychology*, 49(1), 31-57. [https://doi.org/10.1016/0022-0965\(90\)90048-D](https://doi.org/10.1016/0022-0965(90)90048-D)
- Tobón, S. (2006). *Skills, quality and higher education*. Bogotá: Cooperativa Editorial Magisterio.
- Zavala, R. (1993). *Clause integration with verbs of motion in Mayan languages* (Doctoral dissertation, University of Oregon).