

**PEDAGOGICAL MODEL OF AUTOMATON MULTIMODAL RESPONSES FOR THE
LEARNING OF UNIVERSITY STUDENTS**

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Abstract

The objective of this study was to determine the influence of the Pedagogical Model of Automaton Multimodal Responses on the strengthening of teaching practice in a higher education institution. A quantitative approach was adopted, with a pre-experimental design, through the application of a pre-test and a post-test in a single group of 40 teachers. The technique used was the survey and the instrument, a validated questionnaire. The results revealed that the Pedagogical Model of Automaton Multimodal Responses significantly influence the improvement of teaching practice, evidenced by the Student's T-test with a bilateral significance value of 0.000, which allowed the rejection of the null hypothesis. Likewise, a positive impact was observed in all the dimensions evaluated: personal, interpersonal, institutional, didactic and axiological. Consequently, it is concluded that implementing collegial work contributes to improving teacher performance, strengthening collaboration and professional learning, which in turn favorably affects the quality of the educational process.

Keywords: educational strategies, teaching practice, education professionals.

. Introduction

The work of the teacher is related to the socio-educational context in which it is developed; In this sense, it takes it into account in the planning, execution of its activities and the use of tools and didactic materials that contribute to better learning in the various educational spaces that respond to the demands of globalization. It is also important to note that the teaching role is related to the work that can be carried out in cooperation with other teachers, as is the case of collegiate work, which is a good pedagogical tool for the development of education. In this sense, Calderón and Loja (2018) argue that the work of the teacher must be rethought, promoting the development of innovative teaching methodologies, as well as the application of learning processes that need to be adapted to the current reality and to the multiple needs of their students and their characteristics in such a way that they can guarantee inclusive and quality education through the use of various resources and technological tools that contribute to the creation of excellent alternatives to guide, execute and evaluate the dynamics of work in the classroom. With a view to finding options for teaching practice to respond to current demands, Gómez and Flores (2021) state that collaborative work is the best opportunity to share with teachers the disadvantages and advantages of the education achieved in each grade to join forces and enable students to receive good learning. When it is focused on cognitive generation, it is also possible to carry out research that has a direct impact in the classroom, making the teacher, through this collegiate work, the protagonist of this research and including this as part of the collegiate work, the integration of research learning. In another case in Ecuador, Espinoza (2021) points out that collaborative work among teachers needs to be strengthened; In addition, it is necessary to improve communication processes at the institutional level with a positive impact on their professional development. In the same way, it proposes the creation of spaces to favor the comfort of educators, adjusting and adapting the schedules of these activities by area, to optimize their effectiveness. Pedagogical practices, in which collaborative reflection, self-criticism is exercised and learning are learned through experiences of each one reconstructed and versed in their educational practice in each field, to identify academic strategies to improve the management of educational work and analyze the result at the end of a period. In this sense, it was proposed to execute a program of collegiate pedagogical work strategies, to contribute to improving the practice of educators in all areas of their pedagogical work; that is, seeking to have a positive impact on the development of education from the various fields where each teacher carries out their activities. The problem was posed in the following question: How do the pedagogical model of automaton multimodal responses influence the strengthening of teaching practice in a higher educational

institution in Babahoyo? Its main objective was to determine the influence of the pedagogical model of automaton multimodal responses on the strengthening of teaching practice in a higher educational institution in Babahoyo.

Regarding the theoretical foundation of the collegiate work variable, Gutiérrez and Sánchez (2022) consider that it is an effective tactic that has a great impact, which affects the ability to promote tools for improving educational practice, as well as continuously empowering and strengthening teachers, which contributes significantly to improving the quality of education and management. According to MINEDU (2020) and Gutiérrez & Sánchez (2022) indicate that it is a way of organizing, applying strategies in favor of learning, which makes it a place where you have the opportunity to share knowledge and experiences that help strengthen educational practices, thanks to a point of view that interconnects those who participate looking for communicating vessels that favor the educational system. where fame makes them fulfill their advantages in favor of educational objectives.

Similarly, Aguirre and Barrasa (2021) and Méndez (2022) defined collegiate work as a co-development of work, showing the relevance of the individual as organized work that gives strength and specificity to collaboration, making the exercise of the profession easier as the improvement of educational processes, that is, collegiate work is linked to the function of educational institutions, requiring the commitment and location of its members, in addition, it requires minimum theoretical and normative knowledge, as well as situations that usually lead to the development of individual work. It is recognized as a necessary strategy for the development of educators in which research is carried out, and pedagogical action is taken to strengthen teaching practice (Barraza-Barraza & Barraza-Soto, 2014). Almaguer and Llanas (2022) propose that collaborative work is of vital importance because it affects teachers' critical reflection and promotes innovation in their practices.

For such a statement, the Theory of Activity (Muhammad, 2021) was considered as an epistemological support that arises in order to give explanations about human consciousness, taking into account intersubjective relations and the mediation or semiotic interaction that intervenes in such relationships; in addition, new conceptions are inserted to separate subjective actions from joint activities (Espinoza et al., 2021), that is, an attempt is made to demonstrate a minimum unit that supports the explanation of the complex psychological procedures associated with joint activities.

In addition, the Theory of Collective Action, based on the change in society, politics and culture that occurs as a result of joint actions as a social movement and its influence on the application of citizen and political actions in space, as well as collective action, proposes three approaches or trends: the first being known as rational choice based more on a collaborative model (León et al., 2023).

Fullan (2020) defines collegial work as an intentional and structured process of collaboration between teachers that seeks to improve learning and professional development, highlighting that collegial work must go beyond superficial meetings, promotes a deep interaction where teachers build effective pedagogical practices and approaches. This collaboration is key to the systemic transformation of schools, as it combines distributed leadership, a culture of trust, and collective commitment to generate sustainable change.

On the other hand, Hargreaves and Fullan (2021) conceive it as the creation of professional educational communities in which what has been experienced is socialized and their practice is reflected on and strategies to improve teaching are jointly developed; It is therefore an essential tool for strengthening professional capital, which combines specialized knowledge (human capital), relationships (social capital) and shared decision-making (decisional capital). It highlights that this approach fosters innovation, mutual support and commitment to educational change, in addition to the conceptual foundations of collegiate work.

About the variable teaching practice, Moira and Delahunt (2017) indicate that it is a type of action that transcends classroom work and is conceived as a link that energizes, from educational policy to the learning of university students, through a series of methodological and didactic tools that are effective for teacher-student interaction.

On the other hand, it is considered as an intentional action, executed in society and of an objective nature in which the objectives of the individual, the institution and the nation are found. A procedure whose basis is the fundamental interaction between educator and learner and, from there, give rise to new associations in the social, economic, political and cultural contexts; in this sense, these interactions are assumed as dimensions of the study (Ali et al., 2019). Chalco and Pino (2024) and Barrón (2015) in academic articles define teaching practice as an assembly between the knowledge or experiences that have been acquired in the process of professional training or as part of the exercise of the profession.

According to the conceptual bases indicated by Hernández et al. (2020), it is defined as a series of activities developed by the teacher, in which concepts associated with curricular planning, teaching methodologies and, in general, the regulations of the educational field converge. For their part, Alirio and Jaime (2020) define it as a social praxis characterized by being objective and intentional, where the meanings, perceptions, and actions of all educational actors interact. This exercise considers legal, organizational and administrative elements, which modify the role of the teacher according to the educational guidelines of each nation.

The study is based on Socio-constructivism and collaborative learning theory: According to Avilés et al. (2023), the construction of knowledge in teams and situated learning are essential in pedagogical practice. This approach encourages interaction between teachers and students to develop collective competencies and effective teaching practices (Dávila et al., 2024).

Another theoretical foundation is the approach to reflective practice that is fundamental within education, which is based on the idea that teachers constantly evaluate and think about their educational methods, strategies and results. According to Perrenoud, cited by Anijovich and Capelletti (2018), this practice involves a process in which the educator becomes the first evaluator of his or her educational work, adopting a systematic and methodical approach that allows educational experiences to be transformed into meaningful learning. By reflecting on his or her performance, the teacher not only evaluates the results of his or her intervention but also takes into account the processes that led to those results, thus improving the effectiveness of what is taught. This reflection allows immediate adaptation to changing situations, making pedagogical practice more flexible and effective. The general hypothesis: The pedagogical model of automaton multimodal responses significantly influences the strengthening of teaching practice in a higher educational institution in Babahoyo.

2. Methodology

The study was of an applied type, because it sought to verify the degree to which a program of collaborative strategies influenced teaching practice; that is, it was intended to strengthen the work of teachers through the application of collegiate work. On the other hand, the selected approach was quantitative, because a sequence must be followed to measure the independent variable, before and after the application of the program, whose results are presented in tables or figures of descriptive and inferential statistics with which the hypotheses are contrasted.

As for the design, the experimental one was used. Within the experimental ones, the pre-experimental scheme was assumed; that is, pre-test and post-test with a single group.

Regarding the sample population, the 40 teachers of a higher education institution were considered. of these, 4 are managers and have a workload and 36 work as classroom teachers.

The survey was selected as the most pertinent technique to collect information from the perspective of the participants. As for the instrument, the questionnaire was chosen because of the ability to, in a single moment, retrieve broad information on the problem, on its aspects and, through indicators that are the basis for the items; It will be applied as a pre and as a post-test.

Ethical aspects: It is important to indicate that the ethical postulates taken into consideration in this study were that of beneficence, autonomously and unrestrictedly respecting the information collected, which indicates that what was beneficial for the participants was done; non-maleficence, because the only data that were used are those that were collected for academic purposes, and the information was not misappropriated by giving it unintended uses; Another principle was that of autonomy, which implied not having an influence on the way of perceiving those who participate at any time, but allowing them to decide their participation in the study and the way to respond to the questionnaires; and justice, seeking that they are adequately informed so that they can decide their participation, the conditions in which it took place and the benefits that must reach all participants.

4. Results and Analysis

Table 1 shows that when applying the T-Student to check the difference in means between the level of teaching practice, before and after executing the Pedagogical Model of Automaton Multimodal Responses program

Table 1: Descriptive Comparasen Table

Personal dimension	Interpersonal dimension	Institutional dimension	Didactic dimension	Axiological dimension
26,25000	25,75000	26,10000	25,65000	25,62500
37,77500	34,22500	37,05000	36,17500	37,90000
0,000	0,000	0,000	0,000	0,000

Note, prepared by Melba Galarza (2025).

Table 1 shows that, when applying the T-Student to determine the influence of the Pedagogical Model of automaton multimodal responses on the strengthening of the dimensions of teaching practice, it is found that the difference in means in each one is high; in addition, bilateral significance was found to be 0.000; that is, $p < 0.05$, which determines that the program of collaborative work strategies significantly influences the strengthening of the dimensions of teaching practice.

Table 1 shows that when applying the T-Student to check the difference in means between the level of teaching practice, before and after executing the Pedagogical Model of Automaton Multimodal Responses program

Table 2.

Pedagogical model of automaton multimodal responses

Test for a sample						
Test value = 0						
	T	Good Luck	Sig. (bilateral)	Mean difference	95% difference confidence interval	
					Bottom	Superior
Pre-test	57,794	39	0,000	129,375	124,85	133,90
Posttest	69,005	39	0,000	183,100	177,73	188,47

Note, prepared by Melba Galarza (2025).

Table 1 shows that when applying the T-Student to check the difference in means between the level of teaching practice, before and after executing the Pedagogical Model of Automaton Multimodal Responses program; it is appreciated that the bilateral significance is 0.000; therefore, $p < 0.05$; that is, it is assumed that the influence of the collaborative work strategies program is significant in the strengthening of teaching practice. Therefore, it was interpreted that the implementation of the Pedagogical Model of Automaton Multimodal Responses program had a positive and significant influence on the strengthening of teaching practice. The mean difference and confidence intervals also supported this conclusion, showing consistent and well-defined values.

This result allowed us to conclude that the Pedagogical Model of Automaton Multimodal Responses exerted a positive and significant influence on the development of each of the fundamental aspects of teaching practice.

4. Discussion

Regarding the general objective, what was sought was to determine the influence of the Pedagogical Model of automaton multimodal responses in the strengthening of teaching practice in a higher educational institution in Babahoyo. According to how teachers perceive it, the pre-test level was regular since 82.5% considered it so; on the other hand, in the post-test there was a large change because 92.5% considered that the level of teaching practice was good. The T-student was applied, as a non-parametric hypothesis test, with which the difference in pre- and post-test means was verified; The result indicated that the bilateral significance was $p < 0.05$, which assumed that the program of collaborative work strategies had a significant influence on strengthening teaching practice. This objective coincides with Flores (2022) in the sense that the bilateral significance was 0.000, which is less than 0.05, so that, in both cases, the null hypothesis is rejected, and the working hypothesis is accepted.

It was evident that global teaching practice improved after the program, going from an average of 129.38 to 183.10. The good level increased considerably, and the difference was statistically significant ($p = 0.000$), which confirmed the positive impact of the intervention. It agrees with Huirse (2022) in which it was found that there is a positive relationship between collegiate work and the quality of educational work.

The application of the Pedagogical Model of Automata Multimodal Responses program significantly influenced the strengthening of teaching practice in all its dimensions: personal, interpersonal, institutional, didactic and axiological. The statistical results confirmed substantial improvements in both the perceptions and performance of the teachers, showing that collaborative work not only strengthened their individual professional development, but also their ethical, methodological and organizational commitment. These findings broadly coincided with previous studies and provided solid evidence on the effectiveness of collegial work as a strategy to raise educational quality

5. Conclusions

It was determined that the Pedagogical Model of Automaton Multimodal Responses significantly influence the strengthening of teaching practice, which was corroborated by the application of the Student's T-Test, which reported a bilateral significance of 0.000, thus rejecting the null hypothesis and accepting the working hypothesis.

The pedagogical model of automaton multimodal responses has a significant influence on the strengthening of the teacher's personal dimension; this was confirmed with the application of the Student's T-test, whose bilateral significance was 0.000; For this reason, the null hypothesis was rejected, and the working hypothesis was assumed.

The pedagogical model of automaton multimodal responses significantly influences the strengthening of the teacher's interpersonal dimension; this was corroborated by the result of the Student's T-test, which reported a bilateral significance of 0.000; In this sense, the null hypothesis was rejected and the investigation hypothesis accepted.

Collegial work has a significant influence on the strengthening of the institutional dimension of the teacher; therefore, when applying the Student's T-test, a bilateral significance of 0.000 was obtained, which led to the rejection of the null hypothesis and acceptance of the working hypothesis.

The pedagogical model of automaton multimodal responses significantly influences the strengthening of the teacher's didactic dimension; this was confirmed with the T-Student whose application reported a bilateral significance of 0.000; For this reason, the null hypothesis was rejected, and the working hypothesis was assumed.

The pedagogical model of automaton multimodal responses has a significant influence on the strengthening of the teacher's axiological dimension, which was confirmed with the application of the T-Student whose bilateral significance was 0.000; therefore, the null hypothesis had to be rejected, and the investigation hypothesis accepted.

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