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**DIDACTIC STRATEGY
OF LEARNING
THROUGH PROJECTS
TO STRENGTHEN
EDUCATIONAL QUALITY
IN THE FCCA OF THE
UMSNH**

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Abstract: The objective of this article is to strengthen learning and educational quality in collaborative work, evaluating teaching strategies and applying learning through undergraduate projects at the Faculty of Accounting and Administrative Sciences (FCCA) of the Universidad Michoacana de San Nicolas de Hidalgo (UMSNH). Under the hypothesis: In the UMSNH, there are deficiencies in learning and educational quality due to the lack of didactic strategies in collaborative work, the problem is reversed, systematically applying and evaluating the didactic strategy of learning through projects. The Educational Teaching Process (PDE) in higher education institutions (IES), the research is of a mixed type, the methodology of Research - Action, with a cultural historical approach, of Vygotsky and followers.

Keywords: Educational quality, strategy, collaborative work and learning.

INTRODUCTION

The present Research Work is a summary of our predoctoral research, the approach to the problem is as follows: How does the weakness in learning and low educational quality, affect the deficiencies of the application of the learning methodology through projects?

Diagnosis of the problem or situation. According to (Latorre A., 2005), when a problem is already identified, it is necessary to recognize or diagnose it. To do this, we make a comprehensive description and explanation of the current situation. Then, the investigation that begins of the problem detected in the UMSNH is justified, due to the absence of didactic strategies in collaborative work. Deficiency that limits learning and educational quality that was reversed through the analysis, selection, application and evaluation of a didactic strategy. We develop mixed-type research with the Research-

Action methodology and the Historical-Cultural current. For Vygotsky: “the essential feature of learning is that it engenders the area of potential development, that is, that it causes, stimulates and activates in the child a group of internal processes of development within the framework of interactions with others, which then are absorbed by the internal course of development and become internal acquisitions of the child. (Vygotsky L., 2017).

Due to the above, this research is part of the postdoctoral research that we carry out at the Contemporary University of the Americas (UCA) and that will conclude in February 2021, it is entitled “Didactic strategy of learning through projects to strengthen quality education in the FCCA of the UMSNH”, whose main purpose is to strengthen learning and educational quality through the identification, application and evaluation of the AMP teaching strategy in collaborative work at the undergraduate level, in addition to improving teaching practice through Action Research (Vygotsky LS, 1996).

The research is carried out in the accounting educational program of the FCCA of the UMSNH, under the following hypothesis: “At the UMSNH, there are deficiencies in learning and educational quality due to the lack of didactic strategies in collaborative work, the problem, systematically applying and evaluating the AMP teaching strategy”.

When developing the research first, we identified the problem through a diagnosis, with the application of 70 closed-type instruments (questionnaires) to the same number of students; Based on the results of the representative sample, we demonstrate, among other problems, the absence of didactic strategies in collaborative work, which impacts on the low educational quality, second and mainly due to the results obtained from the intervention strategy, which consisted of apply the AMP teaching strategy, supported by the

same instrument made from ten reagents; deriving the independent variable AMP didactic strategy and the dependent variables learning and educational quality respectively.

THEORETICAL BASES

To develop this research we use a mixed methodology, that is, under the qualitative and quantitative paradigms, independent and dependent variable foundation, considering Action-Research as proposed by A. Latorre and under a cultural-historical approach.

We start from the fact that historically in our Meritorious and Centennial UMSNH, in its educational programs at the undergraduate level, collaborative work is explicit or implicit as part of the PDE, however, hard data on school dropouts and failure itself are appreciated, stemming from several factors. : one of them has to do with the weakness in the learning of the students and on the other hand that a higher percentage of teachers do not have didactic-pedagogical tools, much less didactic theories that facilitate learning and this becomes continuous research, cyclical that raises educational quality through teaching practice. Therefore, limiting the problem, the FCCA is not the exception, that is, it is a university problem that is observed through this sample unit. In summary,

TEACHING STRATEGIES

BACKGROUND

Historically within the UMSNH the PDE is developed through collaborative work in educational programs at the undergraduate level, however, there is no history of research on the application of the AMP teaching strategy in said collaborative work and less using the Research methodology - Action.

In our predoctoral research, the “learning didactic strategy through projects to strengthen learning and educational quality in collaborative work at the undergraduate level

of the FCCA of the UMSNH”, was developed under the Research-Action methodology, with a focus on cultural and mixed-type historical current taking the FCCA as a sample, under the following hypothesis: “In the UMSNH, there are deficiencies in learning and educational quality due to the lack of didactic strategies in collaborative work, the problem is reversed, applying and systematically evaluating the didactic strategy of learning through projects.”

The hypothesis was positive, first, because in a school year we diagnosed the problem, supported by the application of a closed-type instrument with 17 reagents, to 70 students of the aforementioned sample educational program, where it was observed that even when collaborative work there are deficiencies in learning due to the absence of didactic strategies, impacting on the low educational quality, second and mainly due to the results obtained from the intervention strategy, which consisted of applying the AMP didactic strategy in two stages, with two interventions each., that is, each stage with an initial and a final application, supported by the same instrument made from ten reagents; deriving the independent variable AMP didactic strategy and the dependent variables learning and educational quality respectively.

With the above, the general purpose of the research was fulfilled: to strengthen learning and educational quality in collaborative work, evaluating didactic strategies and applying learning through projects at the UMSNH undergraduate level. Whose experience we show extensively in the present investigation.

The FCCA still has its 2014-2020 Institutional Development Plan in force, in which a remarkable feature is detected within its long institutional life, it was formally created in October 1917 in said Plan, the dependency projected a horizon of the end

of the this decade, using the different inputs that derive from important advances and achievements made by the FCCA (UMSNH, 2018), such as accreditations, the first of the three educational programs offered by the faculty was the Bachelor of Administration on 10 June 2009, followed by Accounting on November 18 of the same year and finally the Bachelor of Administrative Computing on December 15, 2010 (UMSNH, 2018).

METHODOLOGY

The development of this article was oriented towards the use of a mixed methodology, independent and dependent variable foundation, considering Action-Research as proposed by A. Latorre and under a cultural-historical approach. Diagnosis of the problem or situation. According to (Latorre A., 2005), when a problem is already identified, it is necessary to recognize or diagnose it. To do this, we make a comprehensive description and explanation of the current situation; obtaining evidence that served as a starting point and comparison with the following evidence in which the changes or effects after the application of the action plan are observed. To find the diagnosis of the research problem, the guide recommended by Latorre himself was used according to Figure 1.

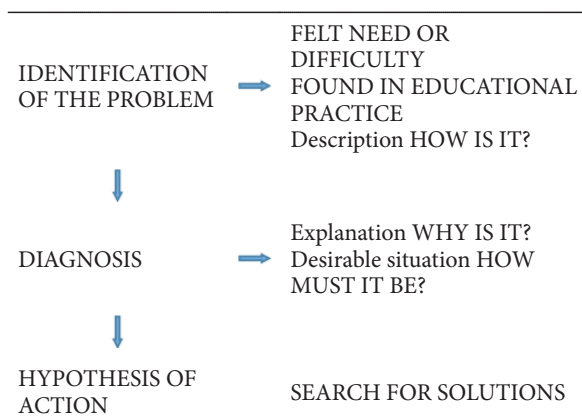


Figure 1. Guide to diagnosing a problem.

Source: Latorre A. (2005).

During the month of July 2018, in order to obtain the diagnosis of the problem, 70 instruments were applied to the same number of students, to three groups with an average of 23 students (that is, to a section of 24 young people), in the educational unit considered as samples of the UMSNH. The total population at the time of obtaining the diagnosis in the FCCA was 1983. We specify that the instruments were applied to 460 students in the fourth semester of the FCCA accounting degree academic program. The objective was that with this sample (70 instruments), represents the behavior of the total undergraduate academic program of the UMSNH with a total population of 35,600 students (Enrollment 2017/2018). (Serna González, 2017).

According to (Baca, 2010), To obtain the data from the instruments, it is necessary to analyze the demand and for this, primary sources were used where the questionnaires were applied in the aforementioned educational program, the level of confidence that was required of 95% was determined with an error or a significance level of 0.05 in the results. As noted above, being a mixed investigation, we proceeded to determine the optimal sample size using statistics.

Solution: We are looking for n (sample size) and we will use the following equations:

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}};$$

From the first equation we can obtain n, but we do not know the standard error of the sample, so we isolate it from the second equation. To calculate Z we must start from the fact that half the area is to the right of the population mean and half is to the left; so we can see that it is symmetric. So we need to divide 0.9500 by 2, which gives us a value of 0.4750. For the area under the curve value of 0.4750, we find that $z = 1.96$ in the normal probability distribution tables; Solving n from the first equation

Giving continuity to the statistical analysis, we performed the hypothesis test of a single sample. Data: H_0 = Null Hypothesis, that is, what is being tested: $\mu = 33.40$, H_1 = Alternative Hypothesis, that is, what would happen if the null hypothesis is not accepted: $\mu \neq 33.40$, $n = 69.45$, $s = 32.23$, $\alpha = 0.05$, Z from tables, considering that we are only going to take into account $1 - 0.05 = 0.95$, therefore $Z = 1.96$, therefore: $LSC = 33.40 + (1.96 * 0.60) = 34,576$; $SCI = 33.40 - (1.96 * 0.60) = 32,224$. These values are located in Figure 3.

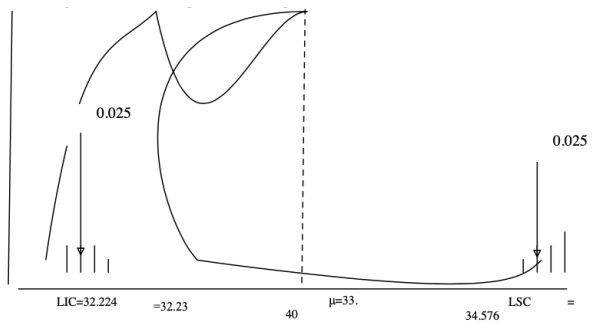


Figure 3. Acceptance zone of the null hypothesis.

Source: self made.

Based on the data obtained above, it was determined that the optimal sample size is 69.45, for practical purposes we apply 70 quizzes for your application with 17 reagents in each instrument, in order to obtain information in a general way, didactic strategies are applied that strengthen the teaching practice and the collaborative work of the accounting degree level of the FCCA of the UMSNH.

General interpretation: how the problem can be seen in its application of the questionnaire on July 2, 2018, showing that there is collaborative work, there are deficiencies in learning and the absence of didactic strategies, which have a downward impact on educational quality.

Objective: Strengthen learning and educational quality in collaborative work, evaluating teaching strategies and applying learning through undergraduate projects at the FCCA of UMSNH.

Hypothesis. In the UMSNH, there are deficiencies in learning and educational quality due to the lack of didactic strategies in collaborative work, the problem is reversed, systematically applying and evaluating the didactic strategy of learning through projects.

Independent and dependent variables.

Teachers are professionals who venture into teaching have not been “taught to teach” and in many cases tend to face the challenge of teaching by reproducing what, in turn,

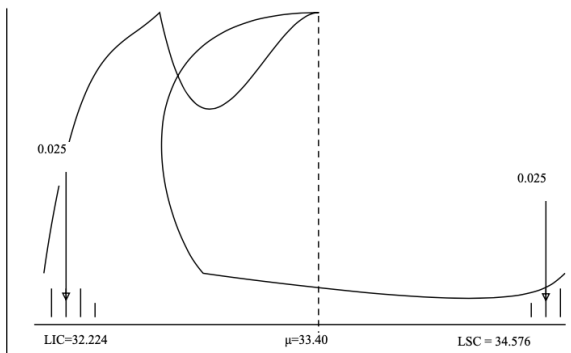


Figure 2. Normal distribution for the determination of the sample.

Source: self made.

In the figure above we can see a normal distribution curve, our null hypothesis would be considered as the mean. We can see at the ends an area marked with vertical lines. It is the proportion of the curve indicated by the level of significance (α), which we can define as the part of the curve that we have defined as the one in which we cannot accept the null hypothesis as valid. Figure 3 reflects that the value of the sample is in the area between the upper and lower limits, so we do not reject the null hypothesis in the diagnosis of the problem. Since the sample value is in the area between the upper and lower bounds, then we do not reject the null hypothesis in diagnosing the problem.

Next, we locate the result in figure 3.

	ITEMS	Yes	Nope	A times
1	Does the teacher or advisor/tutor (A/T), make any diagnosis of each member for the formation of work teams?	19	26	25
2	For the formation of work teams, does the teacher use or (A/T) procedures?	27	26	17
3	Does the teacher or (A/T), facilitate and promote collaborative work between students?	45	6	19
4	Does the teacher or (A/T), guide, organize and supervise the activities team development?	43	8	19
5	Does the teacher or (A/T), promote the practice of ethical behaviors (listen attentively, ask for the favor, respect the turn of the word and the different opinions, etc.) in the interaction with your students?	48	8	14
6	Is collaborative work a good strategy to generate learning?	48	2	20
7	Is the same learning achieved in each member of the work team?	6	3. 4	30
8	Do the members of the work teams show the same responsibility during the development of activities?	5	2	39
9	Do you think that the development of team activities must be at the assigned times for class?	25	25	20
10	During the development of team activities there is always diversity of ideas by the members, are they positive?	33	8	29
11	During the development of team activities there is always diversity of ideas by the members, are they negative?	10	22	38
12	For the development of a team activity, is it important to stipulate how long to work?	49	7	14
13	The decision of the criteria for the integration of work teams Is it from the members themselves?	43	9	18
14	The decision of the criteria for the integration of work teams Is it from the teacher or (A/T)?	22	18	30
15	Does the evaluation you receive for your team activities also is it per team?	21	15	3. 4
16	Is the evaluation you receive for your team activities individual?	18	14	38
17	Do you consider your assessment consistent and equitable based on your activities as a member of a team?	30	13	27

INSTRUMENT AND CONCENTRATE OF THE DIAGNOSIS OF THE PROBLEM

Morelia Michoacan, July 2, 2018

Source: self made.

Independent variable	Dependent variables
<p>teaching strategy learning through projects (AMP). Problem methods: induction and deduction of didactic laws, inferring methodologies, methods and procedures in problem solving.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>1. Did you know the AMP teaching strategy?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>2. Can you use the steps of the AMP teaching strategy?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>3. Do you think that the AMP can help me solve a problem?</p> </div>	<p>Learning concept of the Guiding Base of Learning (BOA); procedural and attitudinal with its 4 levels of assimilation; a) familiarization, b) reproduction, c) production and d) creation. For the case of attitudinal learning, we derive it in habits, abilities, capacities, skills and convictions, both technical and cognitive and volitional.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>4. At this time, could you use the AMP and give a presentation on the topic?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>5. At this time, did the AMP help you in appropriating the concepts of the topic?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>6. With the AMP, do you motivate yourself to read, to search for information, to use new technologies to generate knowledge?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>7. With the AMP, did it help you solve the problem?</p> </div> <p>Educational quality; system of basic, generalized skills that make up the core of the profession. Specific basic skills systems that make up the core of the field of action and the sphere of action. Essential characteristics of competencies.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>8. Would you like your teachers or advisers/tutors to apply the AMP during your training?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>9. Do you consider it feasible that your teachers or advisers/tutors mastered and applied the AMP?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>10. Do you think that with the AMP you can solve problems in your professional life?</p> </div>

Table 1. Independent and dependent variables.

Source: self made.

they experienced as students. (Diaz B, 2010). Statement that coincides with García, in the results obtained from his doctoral thesis “Evaluation of the curriculum of the Faculty of Veterinary Medicine and Zootechnics of the Michoacan University of San Nicolás de Hidalgo” that specify the need to provide the necessary pedagogical tools to teachers to improve their teaching and learning practice. (Valencia HJ, 2015). Learning for Zayas, his conceptual vision is the Learning Guiding Base (BOA); procedural and attitudinal with its 4 levels of assimilation; a) familiarization, b) reproduction, c) production and d) creation. In the case of attitudinal learning, we derive it in habits, abilities, capacities, skills and convictions, both technical and cognitive and volitional. (Alvarez de Zayas, 1992).

Description of the application. Once we defined applying the AMP as a solution, according to the action hypothesis and respecting the methodology of the strategy itself, we proceeded to plan the following week, March 2, 2020, the intervention action in the indicated academic program, with the following characteristics: We start with questions, What is Contador? And in general, investigate the Accountant labor market as a problem.

Fulfilling the objectives of the AMP indicated above, we proceeded to plan the activities, being as follows:

Academic program	application date	Stage
FCCA	March 2, 2020.	First
FCCA	March 9, 2020.	Second

Source: self made.

The AMP's didactic strategy consisted of applying the following activities:

- Work in previously formed collaborative teams.
- Argue the problem.
- Retrieve prior knowledge about the problem through brainstorming; using a CQQ chart to: a) recognize what is known, b) what needs to be learned, and c) what has been learned about the topic.

To solve the problem of the defined topic, the students carried out during a week: a) search of documentary information, b) approach of the solution and c) they socialized the results before the class group.

On March 9, 2020, we repeated the intervention strategy using the same instruments from the previous stage under the following characteristics:

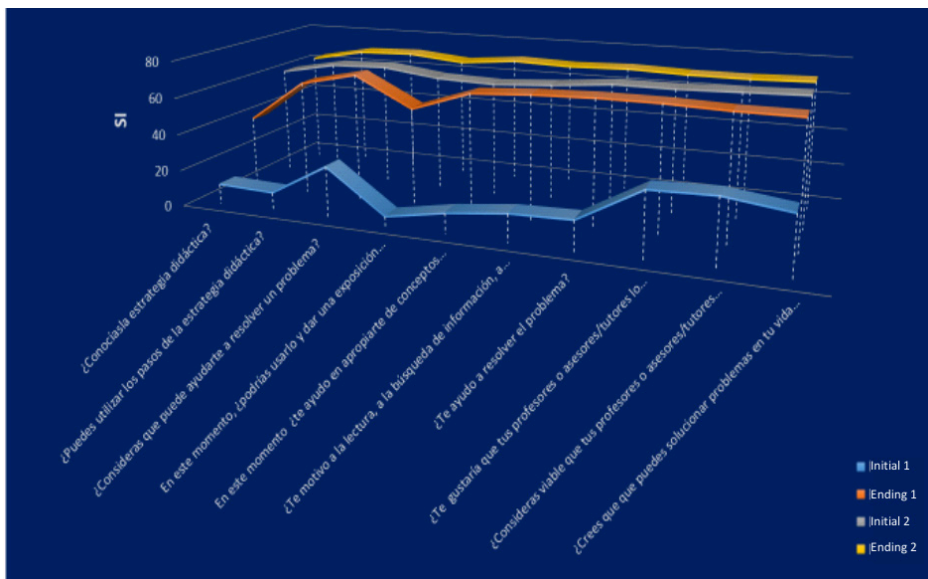
A new title: for this second stage, the problem topic to work on was taken from the syllabus of the Accounting degree from the FCCA of the UMSNH; the topic was "Market Structures".

The determination of the new theme was

to demonstrate that the AMB works with different themes. By applying the AMP we managed to make the student take a leap from the qualitative to the quantitative, from the objective to the subjective and from the empirical to the scientific. Demonstrating that the quality of education rose.

Sessions 1 and 2 of the action-intervention application. Continuing with the development of the research "Didactic learning strategy through projects to strengthen the educational quality in the FCCA of the UMSNH" and once having the diagnosis of the problem and according to Latorre in the research - action, the application of intervention action.

It was decided to apply the AMP didactic strategy, as Frida Díaz B. refers, for this two stages were considered with two interventions each (initial and final), using the same application instrument with ten reagents, of these 3 derive from the independent variable called the AMP didactic strategy, 4 of the dependent variable corresponding to learning and the last 3, of the dependent variable educational quality, illustrated in graph 1.



Graph 1. Results of the application of the intervention strategy of the initial and final MPA, stages 1 and 2.

Source: self made.

As we can clearly see in graph 11, as stages 1 and 2 were applied in their initial and final phases, of the AMP didactic strategy, the students went through ignorance of it, therefore they could not use it and even less obtain an academic benefit, until they get to know it, therefore use it, motivating them to search for information, to appropriate concepts, to read and above all to solve academic problems and even in their professional life, in addition to referring to the importance of that their teachers and advisors/tutors master and apply the AMP teaching strategy.

CONCLUSIONS OF THE APPLICATION AND RESULTS OF THE AMP IN THE DEGREE OF ACCOUNTING OF THE FCCA-UMSNH

Aided by the diagnosis of a problem, by the results obtained by applying the AMP didactic strategy, when running and finishing the investigation we were able to demonstrate the veracity of the hypothesis and reach the following conclusions:

We verify the opinion of Frida Díaz Barriga and Gerardo Hernández, pointing out that the AMP as a didactic strategy gives good results in collaborative work in the pedagogical and research fields.

With the experience obtained by applying the AMP didactic strategy, we modified our teaching work and with it the educational quality was raised, improving the teaching-learning process and placing the student in contact with the culture of facing and being the protagonist to solve academic problems and labor, likewise, I place us as teachers in researchers of our own teaching practice as proposed by the methodology of Research - Action.

We found that the application of the AMP as a didactic strategy gave results in collaborative work because it helped

students in the appropriation of concepts of a topic, motivated them to read, to search for information, to use new technologies to generate their knowledge, to socialization, for the solution of academic problems and in their professional life.

According to the students who gave their opinion in the research, they would like their teachers or A/T to dominate and apply the AMP during their training, faithful witnesses of the advantages of having worked with said didactic strategy.

We demonstrate that the AMP can be applied to different academic programs at the undergraduate level and to various subjects, which allows a better graduation profile based on problem solving, generating surplus value by entering the labor market with quality.

Applying the AMP didactic strategy, we detect in the students their two evolutionary levels: that of their real capacities and that of their possibilities to learn with the help of others, the difference between these two levels was defined by Vygotsky as ZDP. In that sense, we managed to enhance their level of development by positioning them under the guidance of a teacher and in collaboration with a more capable classmate.

We believe that it is necessary to apply the AMP as a didactic strategy in all the educational programs of the UMSNH, with this we would be helping to fulfill the social task of training graduates with high educational quality and responding to the problems that society poses to the university.

DISCUSSION OF THE APPLICATION AND RESULTS OF THE AMP IN THE BACHELOR'S DEGREE IN ACCOUNTING OF THE FCCA-UMSNH

The discussion of the didactic strategy research through projects to strengthen learning and educational quality in

collaborative work at the Accounting degree level of the FCCA of the UMSNH, started from the following hypothesis: At the UMSNH, there are deficiencies in learning and educational quality in the absence of didactic strategies in collaborative work, the problem is reversed, systematically applying and evaluating the AMP's didactic strategy.

Under the Research-Action methodology, we work according to Latorre A. (2005) to demonstrate our hypothesis, making a diagnosis through a closed-type instrument with 17 items, which was applied to 70 students of the educational program, in the bachelor's level in accounting from the FCCA of the UMSNH.

We demonstrate the problem from the first application of the questionnaire, as we can see in the 17 tables with their respective graphs, whose data yielded an interesting diagnosis, that, although there is collaborative work, there are deficiencies in learning due to the absence of didactic strategies, which affect low educational quality.

Based on the concept of strategies under the premise of the joint construction of the ZPD between teachers, advisors/tutors and students (Onrubia, 2017), he proposed several selection criteria to achieve significant learning, the elements that we consider are: 1. Insert the activities carried out by the students, within a broader context and objectives where they make sense. 2. Encourage student participation and involvement. 3. Always make adjustments and modifications to the programming, always starting from the observation of the level of action shown by the students. 4. Make clear and explicit use of language, with the intention of promoting the necessary situation of intersubjectivity (between teacher and students), as well as the sharing and negotiation of meanings. 5. Constantly establish explicit relationships between students who already know and

with new ones. 6. Promote the autonomous and self-regulated use of the contents by the students, a point that all teaching based on the construction of ZPD must have: get the students to do on their own what they could initially do only with the help of the teacher. 7. Make use of language to recontextualize the pedagogical experience. And 8. The interaction between students is considered fundamental, as another valuable resource to create the ZPD. get students to do on their own what they could initially do only with the help of the teacher. 7. Make use of language to recontextualize the pedagogical experience. And 8. The interaction between students is considered fundamental, as another valuable resource to create the ZPD. get students to do on their own what they could initially do only with the help of the teacher. 7. Make use of language to recontextualize the pedagogical experience. And 8. The interaction between students is considered fundamental, as another valuable resource to create the ZPD.

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