

# Learning Strategies In Mathematics For The Participants Of An Alternative Basic Education Centre

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**Abstract:** In the process of basic education, life skills are developed and strengthened. Therefore, it is necessary to apply innovative tools and strategies to strengthen the student's mathematical learning. Objective: To identify the strategies used in the mathematics course, which are expository, teamwork, action, symposium, use of mental maps, comparative charts, and the use of technology in an alternative basic education institution in Callao. The methodology was quantitative, cross-sectional, non-experimental. The study consisted of 60 students who were applied the instrument of learning strategies in mathematics, which consisted of 35 items. Each dimension consisted of 5 questions, measured through a Likert scale. The test was submitted to expert evaluation for validity and reliability tests respecting the corresponding ethical aspects. Among the results found, there is evidence that 24% expositive strategies are developed and 5% strategies using technology. It is concluded that it is necessary to rethink strategies in practice during the learning process to ensure that the competencies of the participant are strengthened in the dimension of statistics and probability, developing learning strategies using technology to enhance the learning of mathematics in alternative basic education

**Index Terms:** Strategies, learning, math and participants.

## 1. INTRODUCTION

The learning process is a challenge that requires the skills, competencies and attitudes of the participant, so called because he or she attends the classes that are taught in alternative basic education. It thus becomes a valuable opportunity to strengthen the experiences and skills required by the participant to perform their work. Learning strategies are fundamental here, since it is a way of learning as an adult, where rhythms, styles, ages, motivations and origin converge. Identifying the strategies they use depends on the motivation for the course and by the teacher. Alternative basic education is aimed at participants who have limitations and obstacles to carry out a regular basic education, from which they were withdrawn voluntarily or involuntarily, highlighting age, work and family. This system is divided into three cycles, the Initial is considered absolute illiteracy, the Intermediate where schooling is incomplete and the Advanced when it acquires a higher level of knowledge, which is equivalent to the four years of regular basic education. Even the services are provided in different modalities: face-to-face, semi-presential and distance. The United Nations [1], argues that education is part of the sense of human right where personal and family development is promoted over time. However, it is essential to guarantee the quality of the educational services provided to participants because of the importance it implies for their lives. It is worth mentioning that there are still millions of people who do not have access to education, both children and adults, due to multiple factors, such as social and economic aspects, among others. Therefore, the importance of providing a basic education and quality is an opportunity that needs to be satisfied in the person to increase their possibilities of personal growth, family and economic aspects among others. On the

other hand, in the international context, researchers such as Galvis, Flórez, Bermúdez and Vera [2], express that there is a need to close achievement gaps in mathematics education and in which there is a technological infrastructure at the service of students and teachers; this focus is very common in Latin American institutions.

It is important to define that strategies are programmed actions that project and are directed towards a specific objective or goal. In order to strengthen educational processes, it is necessary to incorporate diverse strategies for active and cooperative learning, which is why it is necessary to share and use the existing resources in the classroom. However, the challenge is to consolidate this knowledge in a significant way that allows the participant, through learning strategies, to incorporate mathematical competencies and skills that raise the levels of knowledge, stimulating and promoting the mathematical logical capacities of attention and retention of knowledge during the learning process. Participants are able to solve mathematical problems through the application of strategies in the classroom. In Peru, the Ministry of Education (Minedu, 2011-2012) [3;4], establishes that the Peruvian State is aware of the global problem of lack of educational services and lack of educational access of the population at different stages of life. Faced with this need for change and improvement, national policies are proposed to strengthen education services in a comprehensive manner with emphasis on teacher training. (Ministry of Education, 2017). 5], It is important to emphasize that the population that has access to this modality are adolescents and adults who work and study simultaneously. Both components, strategies and adult education, are relevant to improving Peruvian education. This is supported by Gallardo (2017) [6]. Strategies are educational tools that empower people's opportunities to overcome barriers and obstacles to access to education. The development of each one of the strategies is fundamental to complement learning. Fuentes, González, Graus and Rodríguez (2016) [7], who establish that learning allows the possibility of creating an environment of change in the way of life, in thought and in action by acquiring significant learning. In the process of learning mathematics allows the participant to improve knowledge and skills. To implement the strategies of adult education according to Gonzales (2012) [8], they use

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strategies of expositive learning (if one starts from previous knowledge and the interest of the participant), strategies of action learning. During the learning process, personal and group work is promoted. Also the incorporation of mental maps, conceptual, comparative tables and the use of technology. Morales, Marimón, Torres and Lebrija (2018) [9], point out that in the educational process the student is able to understand and use strategies for problem solving, in a systematized way and orders inducing the participant to develop reflexive and creative thoughts. However, from the perspective of Herrada and Baños (2018) [10], they argue that it is necessary to incorporate cooperative learning into the classroom that favors the acquisition and transfer of knowledge information and skills in mathematics, increasing the educational level. The research arises from the need to know the different learning strategies of the participants, since the research found focuses on teaching-learning of regular basic education, but not on alternative basic education. There is a great difference between both modalities, both operate in different and isolated ways, so it is necessary to investigate which learning strategies the participants develop, since in each case age, family, work, fatigue intervene. How do participants learn, if they have different motivations, rhythms, learning styles? What learning strategies are applied in the mathematics course? What strategies do participants use most frequently in the course?. Learning strategies are different from those developed in regular basic education. This research provides information on the different learning strategies of the participants, and it is necessary to strengthen those that have been left aside for the improvement of learning. Learning is linked to autonomy and responsibility. For this reason, participants use strategies to achieve goals and beat competition (Melitón, Gallegos, Vilca, López, 2018) [11]. Exposition strategies are those where discourse is the main role developed. The participant intensifies his knowledge through experience, that is to say, each knowledge offered by the teacher is refuted by the participant, complementing it with experiential examples. The strategies of teamwork are spaces where the participant emerges their knowledge and develop activities established in specific times, generating a group cohesion is not an option individual work, the idea is to join efforts to achieve objectives. (Del Carmen, 2017). [12]. While the action strategies are developed in the classroom as the contests, which generate expectations, the speed when they develop the proposed exercises. However, it generates discomfort in those who have different learning rhythms. Symposium strategies are those used by experts to discuss a topic, where all questions are absolved, here the participant takes the place of the expert, and the answers provided are those acquired throughout their experience. The strategies with mental maps are those that guarantee the development of the mental capacities of the participant through iconography. (Ontoria, R., De Luque, 2017) [13]. These are the strategies that the participant uses as the information enters his brain, i.e. it is subjective. The Strategies with comparative tables are those where the participant elaborates his tables and orders the information poured by the teacher. He makes the distributions according to the importance he considers. These tables are used as substitutes for mental maps, i.e. there are participants who use tables instead of iconographies. Finally, the strategies using technology are those where the participant uses the Tics that favor significant learning. (Cavazos and Torres, 2016). [14]. In this research, participants

only use cell phones and computers in their workplaces. The connection point is only for social networks. The numerical system includes the development of basic operations, law of signs, fractions, percentages, functions and contextualized problems. For the Geometry and Measurement component the contents are angles, rectangles, triangles, areas, perimeters, and contextualized problems. And for the Statistics and Probability component, content is developed on frequencies, graphs, probability and problems. (Minedu, 2012). [4].

## 2 METHODOLOGY

The study was quantitative, applied, descriptive, non-experimental, cross-sectional (Hernández et al. 2014) [15], conducted during 2019. The population consisted of 60 students attending the Manuel Seoane Corrales Alternative Basic Education School. The educational institution has 4 grades at the Advanced level, with an average of 80 participants. For the present study, 60 participants were interviewed between the ages of 12 and 70, of whom 75% were women and 25% were men, and were interviewed at different times. The institution is located in the district of Mi Perú, which corresponds to the Constitutional Province of Callao, and the department of Lima. Each participant had different conceptions and aspirations about their future. The mathematics classes were developed in a traditional way by the teacher of the course, which consisted in the verification of the contents and the theoretical dictation, later the exercises that the teacher elaborated were developed. The instrument used was a questionnaire that collected information for diagnosis and follow-up; it also measured the three components, with alternatives from 1 to 5, using the Likert Scale. The instrument was validated by four expert judges, doctors in education who verified the dimensions and indicators, analyzing the proposed objectives. In its original version there were 40 items, in its final version there were 35 items, 5 items for each dimension. The questions were answered using the Likert Scale of frequency whose answers were from never (1) to very frequently (5). For the reliability of Cronbach's Alpha was 0.841, i.e. adequate. The development of the class sessions was observed, which had an average duration of 40 minutes, the frequency was twice a week. The classes observed were of the subject of mathematics. The curricular experience developed three components: the numerical system and functions; which involved operations and relationships with natural numbers, decimals and fractions, geometry and measurement; which involved measurements of figures and geometric bodies, and statistics and probability, dosing contents.

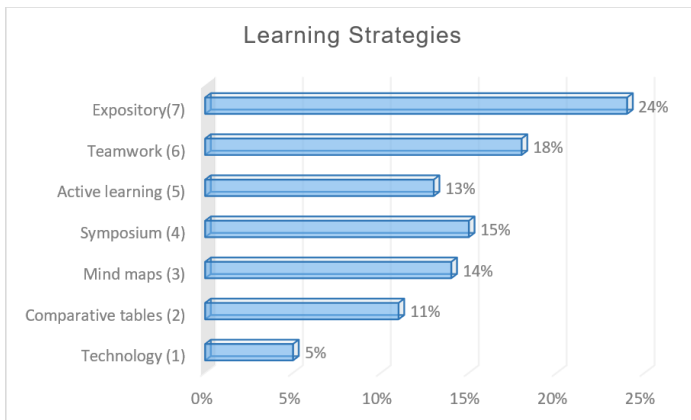
## 3. RESULTS

Table 1. Strategies used by participants in alternative basic education in math classes.

Dimensions	T (1)	Ct (2)	Mm (3)	S (4)	Al (5)	Tw (6)	E (7)	Total
Number system	2%	5%	7%	9%	9%	13%	14%	59%
Geometry	2%	4%	6%	5%	3%	3%	8%	31%
Statistics	1%	2%	1%	1%	1%	2%	2%	10%
Total	5%	11%	14%	15%	13%	18%	24%	100%

**Table 1** shows that participants in alternative basic education develop expository learning strategies (7) and the highest

percentage is 59% in the dimension of the numerical system, 31% in geometry and measurement, and 10% in statistics and probability. In the numerical system strategies of teamwork (6) are developed, of exposition. (7) In the dimension of geometry and measurement, expository strategies are developed (7) and mental maps (3) and in the dimension of statistics and probability, expository strategies are developed (7) teamwork (6) and comparative tables (2) The absence of the use of technology (1) in the three dimensions is highlighted. and the Symposium (4) together with active learning (5) in a minimum percentage.



**Figure 1** Learning strategies in mathematics for the participants of the Manuel Seoane Corrales- Callao-Perú alternative basic education centre.

The graph shows that 24% of participants develop expository strategies, 18% develop team learning strategies, 13% develop action learning strategies, 15% used symposium strategies, 14% used mind maps, 11% used comparison charts and 5% used technology.

#### 4. DISCUSSION

Before the findings of identifying the learning strategies in mathematics of the participants of CEBA in Callao-Peru, it is evident that the participants use expository strategies (24%), this can be compared with what Martínez and Morocho (2018), [16] who conclude that educational institutions do not apply methodological strategies that develop a learning process more practical than theoretical, and do not develop an adequate significant learning. However, Alves (2017), [17] considers it necessary to eliminate old paradigms and to envision new research trajectories in the learning of science and mathematics that, in spite of their advances, cannot neglect the main scenario of the teacher acting as facilitator, that is, in the classroom. León (2019) [18], states that it is necessary for teachers to identify and evaluate strategies and tools useful for the application during the process of learning science and mathematics in the classroom as part of student training. Reinforcing this idea Ravelo, Bonilla, Martell and Toledo (2019). 19], show that managing educational services implies generating competencies in science and mathematics, which need to apply innovative educational strategies, but also incorporate values to maintain an adequate school coexistence. On the other hand, Bances (2019) [20], states that learning strategies include activities that revolve around the discussion of a real problem, previously identified by the participants, which constitutes the starting point for planning and executing tasks, seeking and processing information to

provide possible solutions. Therefore, alternative basic education requires the prioritization of the development of motivational strategies that allow students to improve their skills and competencies in the applicability of mathematics in and out of school hours. It follows that there is an urgent need in alternative basic education to provide participants with the incorporation of new strategies which meet the objectives of meaningful learning. The directors of basic educational institutions must implement improvement plans in the implementation of strategies added to the application of technology that will allow the participant to develop mathematical skills and attitudes that favor learning, this coincides with what was established by Cavazos and Torres,2016. [14].

#### 5. CONCLUSION

It is evident that in alternative basic education institutions, participants apply learning strategies in the classroom. The strategies that stand out are teamwork and exposure strategies. It is important to point out that of all the mentioned strategies, the expository ones stand out in the numerical system dimension and functions, because it is the most developed in the classroom, and the least used are the strategies through technology, since time goes by and the possibilities of a better learning are lost, for this reason it is required the provision of electronic means, among them computers, laptop with Internet services. The contents of the statistical dimension and probability are the least developed and the participant is less likely to use strategies. They often use the same classroom teacher resources considered routine in the process of learning mathematics in the classrooms of alternative basic institutions.

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