

## Learning management strategy for strengthening factual argumentation in secondary school students

Estrategia de gestión del aprendizaje para el fortalecimiento de la argumentación de hechos en estudiantes de educación secundaria



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### Abstract

The general objective of this research was to design a learning management strategy to strengthen the argumentation of facts in first year high school students of the I.E. Horacio Zeballos Gámez. The methodology used was a quantitative approach of applied type, with descriptive scope and with a non-experimental design of transversal mode. The information was obtained from the survey applied to the teachers of the school under investigation. The results show that only 16% of students are at the achieved level; it is understood that 8 out of 10 students need to strengthen their ability to argue facts because they are at a process or beginning level with respect to this skill. Based on the results, a proposal for learning management strategies (monitoring and feedback) was developed to promote the development of factual argumentation processes in the area of Social Sciences to improve the learning of first grade high school students, based mainly on the Theory of Constructivism, on the contributions

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of Piaget and Vigotsky, as well as on Ausubel's Meaningful Learning, also considering the current digital environment and reality.

**Keywords:** Factual argumentation, monitoring, feedback, learning management proposal.

## Resumen

La presente investigación tuvo como objetivo general diseñar la estrategia de gestión del aprendizaje para fortalecer la argumentación de hechos en los estudiantes de primer año de secundaria de la I.E. Horacio Zeballos Gámez. Se utilizó la metodología de enfoque cuantitativo de tipo aplicada, con alcance descriptivo y con un diseño no experimental de modo transversal. La información se obtuvo de la encuesta aplicada a los docentes de la escuela objeto de la investigación. Los resultados demuestran que apenas un 16% de estudiantes está en el nivel logrado; entendiéndose que 8 de cada 10 estudiantes necesitan fortalecer su capacidad de argumentar hechos porque están en un nivel de proceso o de inicio respecto a esta habilidad. En base a los resultados se elaboró una propuesta de estrategias de gestión del aprendizaje (monitoreo y retroalimentación) para promover el desarrollo de procesos de argumentación de hechos en el área de Ciencias Sociales para la mejora de los aprendizajes de los estudiantes de primer grado de secundaria, fundamentada principalmente en la Teoría del constructivismo, en los aportes de Piaget y Vigotsky, como también en el Aprendizaje Significativo de Ausubel, considerando además el entorno y la realidad digital actual.

**Palabras clave:** Argumentación de hechos, monitoreo, retroalimentación, propuesta de gestión del aprendizaje.

## Introduction

Argumentation is a skill framed within the development of critical thinking, which deals with the act of reflecting judiciously and rationally that every person performs when making a decision, expressing their points of view and expressing their value judgments regarding a fact or situation. The development of this thinking of high cognitive demand favors the evaluation of arguments or

propositions and the undertaking of new concepts for the elaboration of conclusions.

Learning management and the ability to argue will influence for or against the quality of what students learn and the pedagogical practice of teachers. This invites us to consider the need to know scientifically about the two variables and their possible influence or how they relate to each other in order to develop approaches to improve in favor of learners.

Arguing is a way of discourse that should be assumed by students and taught in science classes, based on a scientific literacy from a critical reading of different sources, participation in debates and argumentation, according to Osborne (2010) cited by (Sánchez Mejía et al., 2013). One of the main reasons for teaching argumentation is the social nature of scientific knowledge, which makes it necessary for students to construct and analyze scientific arguments with social implications.

According to García-Mila and Andersen (2008), as cited by Sánchez Mejía et al. (2013) the cognitive foundation of argumentation learning is framed in two dimensions: The inter-psychological dimension (group discussion), which seeks the identification of premises necessary for the justification of a postulate, the identification of postulate without evidence in the partner's argument and refuting the partner's advance in arguing; and the intra-psychological dimension which considers that the processes assumed in argumentation are inference (by generating new thought from a previous one), thinking (advanced way of inference with a purpose) and reasoning (advanced way of thinking by evaluating thoughts with respect to a purpose).

Regarding Stephen Toulmin's proposal on argumentation, in his evolutionary theory on sciences, he states that, although our thoughts are individual and personal, our linguistic and conceptual heritage by which these thoughts are expressed, is public property (Sánchez Mejía et al., 2013). This author emphasizes that the processes of science should be directed, not to the accuracy of the handling of concepts, but to the critical attitudes through which students learn to judge, in spite of the concepts expressed by their teachers. In other

words, it is fundamental to explicitly teach processes for reasoning and arguing.

According to Facione (1990) cited by Mora Duque & Parra Peralta (2015), the intellectual skills that constitute critical thinking are: Interpretation, Analysis, Evaluation, Inference, Argumentation / Explanation, Self-regulation. For each of these skills he establishes its meaning and the sub-skills it requires or includes. Regarding Argumentation / Explanation, it indicates that it is the enunciation of results from personal reasoning, its justification based on conceptual, methodological, contextual, and evidence criteria considerations, to then present it as one's own reasoning with convincing arguments. The following sub-skills are established as sub-skills: presentation of results, justification of procedures and presentation of arguments.

For Cepeda Sainea (2019) the levels of argumentative competence are: Level 1: Comprehension of arguments that constitute a simple description of an experience. Level 2: Comprehension of arguments in which data and a conclusion (claim) are clearly identified. Level 3: Comprehension of arguments in which data, conclusions (claim) and justification (warrant) are clearly identified. Level 4: Comprehension of arguments in which data, conclusions and justifications (warrants) are identified, making use of qualifiers or theoretical support (backing). Level 5: Comprehension of arguments consisting of data, conclusion(s), justification(s), support(s) and counterargument(s).

In the search for strategies to develop these levels of argumentation, the Peruvian Ministry of Education has proposed rubrics for the evaluation of teaching performance (MINEDU, 2017), to the extent that teachers seek to develop criticality, creativity and reasoning in their students (Salazar Aguirre & Cabrera, Cabrera, 2020). For this case, the following dimensions are considered: a) to assume a position in favor and against in relation to a topic, b) to expose the reasons for the position assumed and c) to sustain ideas and conclusions exposed; according to the sub-skills of argumentation mentioned by Facione (1990) cited by Mora Duque & Parra Peralta, (2015).

The reviewed works contribute to the theoretical support that highlights the development of argumentative skills and their

attention through learning management. The formulation of the research problem is determined by the question: How does the proposal of the learning management strategy strengthen the argumentation of facts in first year students of the Horacio Zeballos Gámez Tambogrande Educational Institution, Piura, Peru? From this approach, the importance of knowing the argumentative sub-skills that intervene in the learning of argumentation and that will facilitate the approach of the monitoring and evidence feedback processes to improve the development of this ability is highlighted.

The general objective is to design a learning management strategy to strengthen the argumentation of facts in first year high school students of the Horacio Zeballos Gámez Educational Institution. Therefore, this documentary and descriptive study provides information of a scientific nature and constitutes a great effort in the search for improvements in the teaching and learning processes, specifically in the development of argumentative skills.

## **Materials and methods**

The research was developed within an applied quantitative approach with a non-experimental design. In addition, the research had a descriptive scope. Non-probabilistic convenience sampling was used, selecting participants from an educational institution located in the district of Tambogrande in the Piura Province and Region, according to the availability of access. The study group consisted of a total of 32 teachers from I.E. Horacio Zeballos Gámez.

The technique used to collect the data was the survey and the instrument applied was a questionnaire with 25 questions related to the variable argumentation of facts and structured in 3 dimensions: assuming a position, justifying the position and presenting arguments. In addition, the Likert scale was used through the scoring process to facilitate data collection and processing, with 5 response alternatives: (1) Never, (2) Almost never, (3) Sometimes, (4) Almost always and (5) Always.

Similarly, the instrument was measured with Cronbach's Alpha and McDonald's Omega test, reaching a high reliability coefficient by obtaining values above 0.8, as shown in Table 1.

**Table 1.** *Reliability of the instrument*

Scale	Scale Reliability Statistics	
	Cronbach's $\alpha$	McDonald's $\omega$
	0.956	0.963

Source: Own elaboration

On the other hand, the data collected were entered into a matrix in Microsoft Excel in order to be processed and to perform the descriptive analysis. The survey applied to 32 education professionals of the educational institution made it possible to know the perception of the levels of argumentation in which the students of first grade of secondary education find themselves, with results both comprehensively and in each of its dimensions, which are detailed below in tables of frequencies and percentages, providing a clear vision of the difficulties they present and of the processes to feedback.

## Results

**Table 2.** *Frequencies and percentages of the dependent variable Argumentation of facts.*

Range	Rating	VD: Argumentation of Facts	
		<i>f</i>	%
0-49	<i>Home</i>	5	15.63
50-76	<i>Process</i>		68.75
77-100	<i>Achieved</i>	5	15.63
<i>Total</i>			

Source: Own elaboration

Table 2 shows the general results of the factual argumentation variable. The teachers surveyed from Horacio Zeballos Gámez Elementary School state that 68.8% of the students are at the Process level, while only 15.6% are at the Achieved level and another similar percentage (15.6%) are at the Beginning level with reference to the ability to argue facts. Consequently, it can be indicated that according to the perception of the respondents, most of the students need to reinforce the processes of factual argumentation.

**Table 3** Frequencies and percentages of the dimensions: Assume position, Justify position assumed , Present arguments.

Range	Rating	D1: Assume Posture		D2 Justify position assumed		D3 Presenting arguments	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
0-49	<i>Home</i>	5			12.5	0	18.75
50-76	<i>Process</i>				68.7	5	68.75
77-100	<i>Achieved</i>	5			18.7		12.5
					5		50
<i>Total</i>							

Source: Own elaboration.

With reference to Table 3, the respondents affirm that the majority of students (69%) are at the process level with respect to the dimension of assuming a position while the minority is at the achieved level (16%). According to the teachers' perception the majority of students (68.75%) are at the process level with respect to the dimension of justifying assumed posture, while (18.75%) are at the achieved level and the least number of students are at the beginning (12.50%). It is observed that the greatest number of students (68.75%) are at the process level with respect to the dimension of presenting arguments, while the minority is at the achieved level (12.50%); 18.75% of students are at the beginning.

Regarding the results obtained, according to the indicators, it is considered that before the application of strategies, students have a deficient level of argumentation, observing that most of them do not assume a position in favor or against in relation to a certain topic, do not state the reasons for the position assumed, and are not able to support the ideas they present.

The proposal of monitoring and feedback strategies for factual argumentation is proposed: teachers collect evidence at the class level, at the group level and at the personal level, on the students' capacity to argue; giving descriptive feedback and in the best of

cases reflectively or by discovery in order to raise the level of argumentation observed (MINEDU, 2017).

The proposal is justified because based on the Monitoring and Feedback Strategies, factual argumentation will be strengthened in secondary education students for their relevant school and personal performance (MINEDU, 2018). In this proposal, it is intended that for each learning session a pre-class moment, a during class and a post-class moment be considered. In such a way that the monitoring of the evidence of argumentation is carried out and this learning is fed back to the students, questions and answers are formulated back and forth, until a level of development of competencies is generated (MINEDU, 2020; MINEDU 2016).

Monitoring involves collecting evidence produced by the entire classroom, evidence generated by small groups and personal evidence. In turn, giving elementary feedback, going through providing descriptive feedback, until developing reflective or discovery feedback (MINEDU, 2017), regarding the evidence produced by the student individually, in small groups or at the classroom level. The goal is to achieve that the action or product performed by the student has the established evaluation criteria (MINEDU, 2020). And in this goal a feedback to the learning activity is also considered to achieve clarification of aspects that offer difficulties in its understanding and then a feedback to the evidence of learning produced by the high school student (Anijovich, 2019).

The general objective of the learning management strategy proposal, based on the monitoring and feedback of learning evidences, is: To propose management and accompaniment strategies in the development of argumentation processes in the area of Social Sciences for the improvement of the learning of first grade high school students. The specific objectives are: To develop strategies for the disciplinary management of factual argumentation processes in students; To develop support strategies for the development of factual argumentation processes in social sciences; To evaluate the management and support proposal for the development of argumentation processes.

The bases that support the proposal are related to: Learning theories such as constructivism and meaningful learning and connectivism or theory for the digital era and digital humanism. Constructivism proposes an educational paradigm in which the teaching process is characterized by its dynamism, participation and interaction of the learner, so that knowledge results from a real construction made by the learning subject ("cognitive subject"). In pedagogical terms, constructivism is applicable as a didactic conception in action-oriented teaching. Piaget reaffirms that constructivism is centered on the way knowledge is constructed, starting from interactivity with the environment.

In another view, Vygotsky (1989), states that knowledge is centered on how the social environment enables an internal reconstruction process (Sánchez Mejía et al., 2013). In this context, the contribution of this theory to the present work, is given with the incorporation of pedagogical strategies with the use of social networks, in the area of Social Sciences for the strengthening of argumentation. Ausubel's (1998) theory of meaningful learning states that, in order to generate learning in the student, the classroom teacher must develop activities that respond to the interest, needs and expectations of the students. (Sánchez Mejía et al., 2013).

The digital era allows to potentiate student learning through the use of social networks, to meet the challenges of today's world. With connectivism, students are encouraged to use personalized tools, so that technology and the identification of connections are included as learning experiences; which in turn would be taking learning theories towards digital forms. Digital humanism is a new result where cultural heritage converges with information technology, generating a space for sociability. We must use technology always looking for it to serve the human being, making life a simple and enjoyable experience.

The learning management proposal to promote the argumentation of facts necessarily implies a role of trainer and mediator, and this process can be face-to-face, blended, distance, online or virtual or interrelated. (Pino Torrens & Urías Arbolaez, 2020)

The proposal will be structured by 6 learning sessions of 90 minutes, plus 2 complementary evaluation activities. Each of the monitoring

and feedback strategies of the learning evidences are applied. Cognitive and metacognitive strategies are also included as dynamic processes that the learner intentionally executes for the construction of a mental representation of the argumentative process. It is proposed the development of 6 sessions during 2 months, corresponding to a session of 90' minutes per week. Then, in each programmed class, the strategies of monitoring and feedback of evidences will continue to be developed (as a continuity of the sixth session for each teacher). The two evaluation activities are complementary, one at the beginning (expert validation) and the other ongoing (evaluation of achievements with emphasis on monitoring and feedback of evidence). Strategies will be used according to the achievements that are intended to be reached in each stage of the learning session, according to the moments proposed.

## **Discussion**

The results obtained in the dependent variable Argumentation of facts, demonstrate the need to strengthen the development of this ability because only 16% of students are at the achieved level; understanding that 8 out of 10 students need to strengthen their ability to argue facts because they are at a process or beginning level with respect to this skill. The coincidences of the results are given with the study of Guzmán-Cedillo & Flores Macías (2020) The results of both studies point to the need to implement the findings found in the different aspects of the argumentative ability (in this case in the dimensions of the dependent variable), to attend to the development of the argumentative competence hand in hand with formative feedback, while taking advantage of the virtual context for student-teacher interaction in order to achieve improvements in learning and teaching through the development of argumentative processes.

There are coincidences in the results of the study with those of Núñez et al. (2020) This in turn leads to support the need to design a learning management proposal to promote the development of argumentation in the students of the study, generating cognitive resources that allow them to carry out a critical reading.

In this context, the research work of Garcia Alama (2018) is also related to the findings found considering its objectives referred to: a) Development of strategies for disciplinary and didactic management of didactic processes, and b) Implementation of strategies for pedagogical accompaniment in the development of didactic processes and coexistence practices. This is to the extent that in this action research pedagogical accompaniment is determined, in which the deployment of strategies and actions of technical assistance through which a monitor or accompanying person visits, supports and offers permanent advice to the student in the development of learning processes is considered necessary. In addition, personalized and collaborative accompaniment strategies are proposed, based on principles of coexistence, which are fundamental in the development of feedback as a learning management strategy.

The results obtained in Dimension 1 Assuming a position, note the need to propose strategies for its subsequent execution with respect to this argumentative sub-skill, considering that the vast majority of students (84%), have not achieved their level of development. In an adjusted manner, only 2 out of 10 students are capable of assuming a position in favor or against a given fact. These data are related to the study conducted by Atarama Vásquez (2018) The objective of her doctoral thesis was to determine the results of the use of the Critical and Reflective Minds proposal in the elaboration of argumentative texts by students in secondary school at I.E. 15018 Coronel Andrés Rázuri in the District of Tambogrande-2018.

The relationship occurs before using the Critical and Reflective Minds Program, since 66.7% of the students in the control group and 56.6% in the experimental group were at the beginning level of the elaboration of argumentative texts, showing deficiencies in the microstructural, macrostructural and superstructural dimensions. These data are similar to those obtained in this argumentative dimension 1, in terms of their level of achievement. After using the proposal, the experimental group presented significant improvements, which in turn leads us to propose the design of the proposal and its subsequent execution to promote factual argumentation in students, also seeking to obtain good results in their learning.

The results obtained in Dimension 2 Justify the position assumed, lead to establish the need to design and then implement a proposal for a learning management strategy to strengthen the argumentative skill, considering specific strategies to promote the sub-skill of justifying the position assumed by the student in the development of a fact. We observe that the great majority of students (81%) have not obtained the level achieved in this dimension of argumentation. This means that 8 out of 10 students are not able to justify the 'position they assume regarding the eventuality of an event.

These data are related to the research conducted by Chavez (2019)Chavez, who in his doctoral thesis had the purpose of knowing the level of critical thinking and the levels of reading comprehension. There is coincidence in that it is possible to evaluate the levels of critical thinking skills in its five dimensions, as has been done with the argumentative skill in its three dimensions through the corresponding items.

The results obtained in Dimension 3 Presenting arguments, necessarily lead to formulate a proposal that makes possible the strengthening of the argumentative sub-skill of presenting arguments before the development of a fact. It is observed that 88%, which is the great majority of students have not obtained the level achieved in this argumentative dimension, which leads to affirm that only 1 out of 10 students is capable of presenting arguments before a developed fact.

These data are related to the study carried out by Cepeda Sainea (2019)Cepeda Sainea, who developed a qualitative research of descriptive scope whose objective was to describe the level of argumentation during the learning of the concept of breathing. In our case, the objective is related to the characterization of the level of argumentation during the development of learning management strategies, such as evidence monitoring and feedback as accompaniment to the student. Likewise, didactic intervention is sought to strengthen the development of argumentative skills in students. There is coincidence in the level of achievement of the arguments, which were characterized by superficial justifications, data based on experience rather than on a scientific construction of the concept. This gives rise to encourage the construction of

arguments based on properly argued scientific research, starting with the design of a functional proposal.

This work is of great relevance since it is part of an innovation that aims to take monitoring and pedagogical support at the school level to learning management at the classroom level, considering the monitoring of evidence and feedback as support strategies in favor of the student.

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