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RESEARCH ARTICLE

Teaching strategies to achieve significant learning in university students in Peru

Estrategias de enseñanza para el logro de aprendizajes significativos en estudiantes universitarios de Perú

Estratégias de ensino para a realização de aprendizagens significativas em estudantes universitários no Peru

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Abstract

Introduction: The interest in addressing the problem of achieving significant learning has not only been directed at basic education but at the higher level, since in the first years of university and especially with general studies, students show problems in achieving significant learning. without a doubt, the first concern has focused on teacher teaching strategies. Therefore, the objective of this study was to determine the incidence of teaching strategies in the achievement of significant learning of students in a private University of Huancayo (2023). **Methodology:** A basic type of research was developed, with a descriptive design, under a quantitative approach; The sample was 85 undergraduate students enrolled in comprehensive communication courses in the 2023-1 cycle and the survey was used as a data collection technique. **Conclusions:** Concluding that there is an impact of teaching strategies on the achievement of significant learning of students in a private University of Huancayo, because a Sig coefficient of .000 was found, which was statistically significant because it was <0,05. Likewise, the variability of learning achievements was explained by 57.1 % by the independent variable.

Keywords: Effectiveness; Teaching strategies; Significant learning; University students

Resumen

Introducción: El interés por abordar el problema del logro de aprendizajes significativos no solo se ha direccionado en la enseñanza básica sino al nivel superior, toda vez que en los primeros años universitarios y, en especial, con los estudios generales los estudiantes muestran problemas en el logro de aprendizajes significativos. Sin duda, la primera preocupación se ha centrado en las estrategias de enseñanza docente, por lo que este estudio tuvo como objetivo determinar la incidencia de las estrategias de enseñanza en el logro de aprendizajes significativos de los estudiantes en una universidad privada de Huancayo (2023). **Metodología:** Se desarrolló una investigación de tipo básico, con un diseño descriptivo, bajo un enfoque cuantitativo; la muestra fue de 85 estudiantes de pregrado matriculados en los cursos de Comunicación Integral en el ciclo 2023-1 y se utilizó la encuesta como técnica de recogida de datos. **Conclusiones:** Se concluye que existe incidencia de las estrategias de enseñanza en el logro de aprendizajes significativos de los estudiantes en una universidad privada de Huancayo, porque se encontró un coeficiente Sig. de 0,000, el cual fue estadísticamente significativo por haber sido <0,05. Asimismo, la variabilidad de logros de aprendizaje fue explicada en un 57,1 % por la variable independiente.

Palabras clave: Efectividad; Estrategias de enseñanza; Aprendizajes significativos; Estudiantes universitarios

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RESEARCH ARTICLE

Resumen

Introducción: O interesse em abordar o problema da realização da aprendizagem significativa não foi direcionado apenas para a educação básica, mas também para o nível superior, já que nos primeiros anos da universidade e, principalmente, com os estudos gerais, os alunos apresentam problemas na realização da aprendizagem significativa. Sem dúvida, a primeira preocupação se concentrou nas estratégias de ensino, portanto, este estudo teve como objetivo determinar o impacto das estratégias de ensino na obtenção da aprendizagem significativa dos alunos de uma universidade particular de Huancayo (2023). **Metodologia:** Foi desenvolvida uma pesquisa do tipo básica, com um desenho descritivo, sob um enfoque quantitativo; a amostra foi de 85 alunos de graduação matriculados em cursos de Comunicação Integral no ciclo 2023-1 e a pesquisa foi usada como técnica de coleta de dados. **Conclusões:** Conclui-se que há incidência de estratégias de ensino na obtenção de aprendizagem significativa dos alunos em uma universidade privada de Huancayo, pois foi encontrado um coeficiente Sig. de 0,000, que foi estatisticamente significativo, pois foi <0,05. Da mesma forma, a variabilidade da realização da aprendizagem foi explicada em 57,1% pela variável independente.

Palavras-chave: eficácia; estratégias de ensino; aprendizagem significativa; estudantes universitários.

Introduction

In Latin America, there have been significant experiences in reading comprehension and learning. Thus, for Olvera-Guevara et al. (2023, p. 24), in the case of a Mexican university, it was possible to identify the reasons for failed courses and student desertion, from which intervention proposals were made in general studies to mitigate the incompatibility in the development of learning. Similarly, in Costa Rica, the predisposition of a neurolinguistics program due to educational virtuality evidenced improvements in the intrapersonal skills of university students and in argumentative textual comprehension (Sanabria-Araya, 2023, p. 217). In the Ecuadorian case, the proposal of Guamán Condoy et al. (2023, p. 499) is relevant. In view of the difficulties of text comprehension in foreign language teaching by undergraduate students, they proceeded to unblock and adapt learning styles through individualized and collective attention to mitigate the rates of failure and academic problems.

At the national level, the problem of reading comprehension and the development of learning according to the styles of individuals has experienced a similar situation, so much so that, according to Castillo Córdova et al. (2023, p. 93), a low level of text comprehension skills is observed prior to virtuality, which increased with the prolonged quarantines. In this sense, literal comprehension continues to show problems in the students, which merits a greater willingness to dialogue and the practice should be strengthened to show adequate knowledge and emphasize collaborative work, so that collective support allows convenient guidance in the development of learners in reading comprehension.

At the local level, Navarro Veliz (2023, p. 158) was considered. 158), for whom, after the pandemic of cocaine-19, the problem of student learning has increased and the greatest difficulties have manifested themselves in the comprehension of texts and, in particular, argumentative texts, identifying that students prefer not to take writing or scientific and argumentative comprehension courses in regular cycles because of the perception that they are difficult; However, reading comprehension difficulties are a national problem both in regular basic education and at the higher level, so it is necessary to develop plans and programs that strengthen reading comprehension and that involve teachers and students, not only addressing the literal level, but also gradually moving towards the argumentative aspect.

Faced with the problem described above, the following question was posed: how do teaching strategies affect the achievement of meaningful learning by students at a private university in Huancayo (2023)? This research is justified because indispensable proposals were addressed to focus on teaching strategies, such as those of Díaz Barriga Arceo and Hernández Rojas (2003) and Kolb (1984), who state that the formative process of students is in accordance with their rhythms, the situational context and their mental structures. Likewise, these authors state the importance of the attitudinal, conceptual and procedural development of students. Thus, the study was justified because, due to the adequate use of learning styles, the bases were determined so that teachers and students can optimally develop class sessions at any teaching level, prioritizing the needs and demands of the learners.

In this context, the objective achieved in this study was to determine the incidence of the strategies

The hypothesis was that teaching strategies affect the achievement of significant learning of students in a private university in Huancayo (2023). The hypothesis demonstrated was that teaching strategies have an impact on students' learning achievement in a private university in Huancayo (2023).

Theoretical framework

The main antecedents of this study served as indispensable theoretical references in the research. In this sense, the first antecedent corresponds to Obloberdiyevna and Odilkhonovna (2022, pp. 23-28), which aimed to identify the peculiarities, strengths and adaptations of the educational models for understanding a foreign language of two Uzbek university institutions in Samarkand, where the results have identified that the use of computer technologies and communicative interaction between peers are effective strategies, concluded that the continuous implementation of teaching strategies around the learning of a foreign language by students should be in accordance with their pace of academic progress.

On the other hand, the research of Salaxiddinovna (2022, p. 109) in which the purpose of the study was the identification of the problems of teaching comprehension and writing in English at the higher level, whose findings have identified a high level in the mentioned variables and academic interest in the comprehension of texts in English. Therefore, it was possible to conclude the relevance of the use of digital resources for the improvement of the teaching of textual comprehension of another language by university students.

The research by Valdés-Léon et al. (2022) had the objective of identifying the salient characteristics in relation to reading strategies, metacognitive strategies and textual comprehension performance, whose findings showed that one of the most widely spoken languages is the least used in academic activities; on the other hand, Spanish presents certain comprehension difficulties, especially by students from the interior of the country. It is concluded that reading strategies should be strengthened in both spoken languages in order to develop reading comprehension and textual production.

In terms of learning, it is interesting to note the research of Oktorianisarry et al. (2023), whose purpose was to determine the effects of collaborative strategic reading in relation to the cognitive abilities of reading and textual comprehension in students of a faculty of studies, whose results were able to identify that the achievements of academic improvement were obtained with the use of this strategy and were strengthened with extracurricular implementations, concluding that the relevance of strengthening the teaching strategies of teachers so that they can collaboratively develop reading comprehension and production from a scientific perspective.

Similarly, Leijon et al. (2023) aimed at identifying the main linguistic strategies used by teachers in the higher education process and the findings showed that teachers use individualized methods and, to a lesser extent, collaborative or joint action methods. It is concluded that there is an urgent need to implement in teachers the predisposition of viable strategies to optimally lead the development of reading comprehension at the higher level.

Similarly, the research carried out by Sánchez-Cotrina (2023) in a university in the eastern Amazon region was considered, whose objective was to establish the incidence between the variable

study and self-regulation of the participants of a faculty of general studies. The results showed a high incidence between the respective variables and dimensions, concluding that the innovative and reflective factors are conducive to the most representative styles, and it is essential to strengthen their faculties during the professional training development.

On the other hand, the research of Calderón Arévalo et al. (2022) carried out in the school environment of a district of East Lima had the purpose of establishing the incidence of gamification as a teaching strategy in textual comprehension virtually during the covid-19 pandemic, whose results showed the prioritization of gamification in its technical-analytical contributions in the inferential use of texts to generate interpretative processes in the participants. They conclude to promote the implementation of activities in the study plans that include the strengthening of this teaching strategy and the use of digital tools for the development of text comprehension activities.

Likewise, the research of Alcas et al. (2019) had the purpose of establishing the influence of metacognitive strategies in text comprehension during the academic activities of the participants, whose results showed the influence of the proposed variable in the activities of the students on a regular basis, which implied a continuous improvement of this process. We conclude the relevance of proposing and implementing viable strategies by teachers and university authorities to promote the optimal development of students' reading comprehension.

Teaching strategies

In this aspect, Kolb's (1984, p. 123) proposal stands out, which defines teaching strategies as the procedures and diverse processes of the way in which people learn about knowledge and attitudinal aspects as formative actions of a reality, in this way each individual, possessing a certain style, is strengthened in perspective with the experiences and the usefulness that each individual has to learn during the teaching process. The proposal prioritizes actions that arouse motivational interest in learning according to the individual characteristics of each learner, which is manifested during class sessions. Likewise, according to Valenzuela and Barrios (2020, p. 847), in the teaching process, the implementation of teaching strategies for the improvement of pedagogical practice is fundamental; thus, participants tend to learn with greater emphasis and speed when they focus on an active methodology before, during and after the teaching process at the higher level.

In this context, Díaz Barriga Arceo and Hernández Rojas (2003, p. 126) point out teaching strategies as techniques that allow guiding the participants of an educational reality in the relevant decision making around the knowledge that is in development and focused on the fulfillment of the achievement of learning. Likewise, Arellano (2016) indicates that teaching strategies support the teacher with the students to guide them to arouse interest in learning and that it is profitable for academic development; this guidance support is evident in the processes to the resources that are usually used to achieve learning. According to these positions, teaching strategies are classified into three dimensions: pre-instructional, instructional and post-instructional.

With regard to pre-instructional strategies, Vargas-Murillo (2020, p. 117) points out that evidence of

The educational action in predisposing to what is to be learned and how it is to be done, with early stimulation being fundamental as a pertinent way of developing understanding. Therefore, prior knowledge and initial questions that generate informative activities and can be systematized constitute referents of these strategies. The purpose of the type of pre-instructional strategies is to allow the orientation that will show the class session, including the capacity that evidences the didactic procedure to continue and the learning achievement that is intended to be reached, which constitutes the documentary reference to be fulfilled in accordance with the teaching work and the academic development of the students (Barleta, 2008, p. 97). The activation of prior knowledge allows an approach to the knowledge that students possess and are considered strategies that are predisposed to activate them sequentially, stimulating the notions they have about a certain knowledge to be strengthened in the teaching process (Díaz Barriga Arceo and Hernández Rojas, 2007, p. 89).

For Manjarrez Pontón and Romero Rincón (2022, p. 116), instructional strategies refer to the curricular argumentative support in relation to the procedure for the achievement of learning, which allow the execution of functions directed to the detection of relevant information that leads to a relevant conceptualization supported by graphic organizers, images or other convenient resources with formative intentionality and understanding of the processed information. In this sense, they serve as curricular support to maintain the motivational interest of the teaching process and the activation of the activities to be performed by students (Romero, 2019, p. 117).

Post-instructional strategies, according to Granda Uyaguari et al. (2023, p. 10447), tend to deal with what should continue to be studied and facilitate the participants' own appreciation of their academic progress from an integral perspective, with summaries being a clear example of this proposal. The strategies that stand out the most are the links considered by Romero (2019, p. 119), a technique that facilitates the predisposition of bridges between previous and new knowledge. Similarly, Sánchez Upegui (2009, p. 6) points out that summaries are an informative synthesis that are intended to be learned and show educational relevance, for their argumentative proposals that allow learners to develop their new knowledge, and analogies show similarities in relation to an event that has occurred and to understand abstract topics.

The apprenticeship

Regarding learning, it is important to consider the theoretical contribution of Ausubel (2002, p. 98) in asserting the relevance of prior knowledge that allows the meaningful identification of learning and the use of pertinent strategies for the attainment of educational achievements. Similarly, Bruner (2001, p. 122) states that the simplification of aspects of reality and the cognitive predisposition based on the support of means are materials aimed at the achievement of learning. The contribution of Piaget (1998, p. 78) was also considered, for whom the learning process is fundamental in accordance with externalized interaction, an experience that leads to the construction of knowledge and strategies that represent a key contribution to formative development.

Regarding learning achievements, Castillo Arredondo and Cabrerizo Diago (2010, p. 79) indicate that it is an acquisitive process of a variety of skills and capacities that assimilate specific information regarding a new knowledge developed. They also provide individuals with the possibility of knowing and assimilating cognitive, procedural and attitudinal aspects in the medium and long term. Likewise, Carrasco Huamán (2019, p. 214) points out that learning achievements are the sequence of ac-

The purpose of these activities is to modify and acquire competencies, skills, contents and attitudes that are indispensable for the formative development of individuals, which constitute one of the essential functions in the rational activity of people.

Regarding cognitive or conceptual learning, Bruner (2001, p. 87) argues that individuals elaborate in a relevant way mental structures such as contents and specific relationships through the process of informative analysis with what is intended to be learned from the reality in which they develop on a daily basis. For Leijon et al. (2023, p. 616), this type of learning focuses on the proper arrangement of an idea and its particularities around various respective situations and events. In that sense, it addresses the recognition and association of the characterizations proper to the events, thus, learning is adapted to a particular situation by challenging human intelligence and encouraging problem solving and transferring what has been learned.

Procedural learning is related to the activities that are carried out and performed on a daily basis, which are indispensable for the development of these active and dynamic capabilities. This learning is acquired gradually through practicality and the characteristic skills of each individual (Araújo et al., 2022, p. 104). According to Figari Medina (2022, p. 73), it is related to the sequential acquisition of skills, partly as a result of the reflexive exercise of actions, skills to perform specific actions. Undoubtedly, they constitute diverse forms of action, whose particularity is circumscribed to an organized and ordered action of sequences of complex skills, as opposed to a behavioral habit.

As for attitudinal learning, Olmedo-Plata (2020, p. 145) specifies that it is a continuous process of educational, durable and stable nature, whose purpose is to strengthen the development of the socioemotional stage of individuals as a complementary part of the cognitive area, which leads to the integral formation of the human personality. For the development of this type of learning, it is essential to consider the object of learning which, according to Salamanca (2022, p. 140), is a fundamental informative resource that evidences interaction and is usually used to share experiences and develop learning in an experiential way.

Methodology

The research was conducted under a quantitative approach because the information collected in the fieldwork with students of a private university was used, which, after its arrangement, it was possible to have relevant arguments around the research approach and, with the SPSS statistical program and inferential procedures, it was possible to contrast the research hypotheses and strengthen the research process (Valderrama Mendoza, 2015, p. 87). Likewise, the research corresponded to the basic type, because new knowledge was generated regarding teaching strategies for the achievement of meaningful learning, which is the result of the research process that is focused in an organized way to increase its content in correspondence with the reality of university students (Palella Stracuzzi & Martins Pestana, 2017, p. 85).

The research design of the quantitative approach was pre-experimental because it consisted in the administration of a stimulus or treatment, that is, through teaching strategies, the administration of a stimulus or treatment, that is, the administration of a stimulus or treatment through teaching strategies.

to the research sample made up of university students, and then a measurement was applied to observe the level of achievement of significant learning (Hernández-Sampieri & Men- doza Torres, 2018, p. 156).

For this study, the population corresponded to the students of a private university in Huancayo, who totaled 5,000, and considering that they correspond to a finite population, we proceeded to obtain the sample size by estimating a 95% confidence level and the following parameters: Z = 1.96, p = 0.94, q = 0.06 and E = 0.05, after which the sample size was 85 undergraduate students enrolled in the Integral Communication courses in the 2023-1 cycle of a private university in Huancayo. For the case of sampling, non-probabilistic convenience sampling was considered, because this sampling facilitated the selection of the components of the population in accordance with the accessibility and convenience to carry out the research process (Hernández Sam- pieri et al., 2010, p. 178).

The survey was used as a data collection technique and a questionnaire was used as a data collection instrument, which met the criteria of validity through expert judgment and reliability through Cronbach's alpha test. The results have been presented under a first stage of analysis of assumptions necessary to proceed with the statistical analysis. After this stage, the multivariate analysis was presented.

Results

Compliance with assumptions

The multinomial logistic regression analysis requires the fulfillment of assumptions, in this sense, first, a normality test was performed to determine whether or not the data have a normal distribution. Second, the Durbin-Watson analysis was performed to evaluate the autocorrelation between the exogenous variables. Third, the variance inflation factor (VIF) and tolerance test were performed to evaluate whether there is correspondence between the predictor variables. Fourth, a reliability analysis was performed using Cronbach's alpha statistic.

Normality test of data fits

The normality analysis was performed using the Kolmogorov-Smirnov statistic, because the data evaluated are greater than 50. The decision rule keeps the following assumptions as parameters.

Decision rule

Null hypothesis: Values are normally distributed (values above >0.05).

Alternate hypothesis: Values are not normally distributed (values below <0.05) (Table 1).

Table 1.
Normality tests

	Kolmogorov-SmirnovaShapiro-Wilk					
	Statistician	**gl**	**Sig.**	**Statistician**	**gl**	**Sig.**
Pre-institutional strategies	0,109	85	0,014	0,965	85	0,021
Instructional strategies	0,357	85	0,000	0,618	85	0,000
Post-institutional strategies	0,38	85	0,000	0,873	85	0,000
Teaching strategies	0,191	85	0,000	0,825	85	0,000
Attitudinal learning	0,101	85	0,033	0,969	85	0,038
Conceptual learning	0,160	85	0,000	0,944	85	0,001
Procedural learning	0,079	85	0,200	0,980	85	0,223
Learning	0,116	85	0,007	0,958	85	0,007

[a] Lilliefors significance correction.
Source: Own elaboration.

According to the results, it is determined that the data present a non-normal distribution, because the Sig. coefficients were <0.05, only the Procedural Learning dimension had a Sig. coefficient of 0.200; however, authors such as Rodríguez Flores et al. (2023) indicate that the conceptual contributions provided by the dimension should also be evaluated, and that it is the only dimension that presents an anomaly that is not very representative for the global model.

Data autocorrelation test

This assumption was overcome by the Durbin-Watson autocorrelation test, which indicates that its absence is only apparent when the data are between the ranges 1.5 and 2.5 (Table 2).

Table 2.
Durbin-Watson Test

Model	R	R square	Adjusted R-squared	Standard error of the estimate	Durbin-Watson
1	0,523a	0,274	0,256	0,38601	2,160

~~Predictors: (Constant), Teaching strategies. Dependent variable: Learning achievement.~~
Source: Own elaboration.

The data found fell within the window of acceptance, i.e., within 1.5 and 2.5, so there is no autocorrelation.

Data collinearity test

The collinearity assumption was overcome by the tolerance and VIF test, where the acceptance assumption mentions that the data should have a tolerance index of >0.1 and VIF should be <10 (Table 3).

Table 3.
Collinearity statistics

Model	Statistics o f collinearity	
	Tolerance	VIF
(Constant)		
Teaching strategies	0,955	1,047
Reading comprehension	0,955	1,047

a. dependent variable: learning achievement.
Source: Own elaboration.

The data found fell within the acceptance values (0.955 is >0.01) and for VIF (1.047 < 10); therefore, multicollinearity problems are ruled out (Table 4).

Reliability test

Table 4.
Reliability test

		N	%
Cases	Valid	85	100,0
	Excluded	0	0,0
	Total	85	100,0
Cronbach's alpha	Dimensions and variables	12	0,867

Source: Own elaboration.

Regarding the reliability of the measure, the data were evaluated using Cronbach's alpha statistic, where values above 0.07 present a good level of acceptance. In this sense, the value found was (0.867, being >0.07), so the measure is accepted as reliable.

Descriptive results

Regarding the descriptive results of the Teaching Strategies variable (independent variable), we have (Table 5):

Table 5.
Levels of teaching strategies

	Pre-instructional strategies	Instructional strategies	Post-instructional strategies	Teaching strategies
	Low7	%6	%0 %0	%9 %
	Regular66	%20 %20	%0	%37 %37 %
	High27 %27 %	74	%100	%54 %

Source: Own elaboration.

The levels were determined as low, regular and high. Under this scheme, the dimension Pre-institutional Strategies presented a low level of 7%, a regular level of 66% and a high level of 27%; the dimension Institutional Strategies presented a low level of 6%, a regular level of 20% and a high level of 27%; the dimension Institutional Strategies presented a low level of 6%, a regular level of 20% and a high

level of 27%.

high level of 74 %; the dimension Post-institutional strategies presented a low level of 0 %, a regular level of 0 % and a high level of 100 %, and the variable Teaching strategies was found at a low level of 9 %, a regular level of 37 % and a high level of 54 % (Table 6).

Table 6.
Levels of learning achievement

	Attitudinal learning	Conceptual learning	Procedural learning	Learning achievements
Under	6 %	18 %	8 %	5 %
Regular	61 %	55 %	61 %	79 %
High	33 %	27 %	31 %	17 %

Source: Own elaboration.

The determination of the levels was low, regular and high. Under this scheme, the *Attitudinal Learning* dimension presented a low level of 6 %, a regular level of 61 % and a high level of 33 %; the *Conceptual Learning* dimension presented a low level of 18 %, a regular level of 55 % and a high level of 27 %; the *Procedural Learning* dimension presented a low level of 8 %, a regular level of 61 % and a high level of 31 %, and the *Learning Achievement* variable was found at a low level of 5 %, a regular level of 79 % and a high level of 17 %.

Inferential results

General hypothesis test

HA: Teaching strategies affect the achievement of meaningful learning of students in a private university in Huancayo (2023).

Ho: Teaching strategies do not affect the achievement of significant learning by students at a private university in Huancayo (2023) (Table 7).

Table 7.
Model fit information

	Model fit criteria	Likelihood ratio tests		
Model	Logarithm of the likelihood -2	Chi-square	gl	Sig.
Intersection only	54,130			
Final	9,468	44,662	8	0,000

Source: Own elaboration.

For the multinomial test, the evaluation of the model was done through the likelihood ratio test, in this sense, it corresponded to look at the degree of significance found, which in this case was 0.000, which shows the acceptance of the alternative hypothesis and the rejection of the null hypothesis, since all Sig. data <0.05 show acceptance of the hypothesis and all Sig. values >0.05 refer to the acceptance of the null hypothesis.

rejection. Therefore, teaching strategies have an impact on the achievement of meaningful learning by students in a private university in Huancayo (2023) (Table 8).

Table 8.
Independent likelihood ratio tests

	Model fit criteria	Likelihood ratio tests		
Effect	Logarithm of the likelihood -2 of small model	Chi-square	gl	Sig.
Intersection	9,468a	0,000	0	.
Teaching strategies	24,074	14,606	4	0,006

Source: Own elaboration.

After evaluating the global measure of the model, it was time to measure the model independently, using the same method given by the log likelihood, which gave us the Sig. coefficients. For the independent variable Teaching strategies, the Sig. was 0.006 and, when comparing these data with the Sig. values given by the rule (<0.05), it is statistically significant; consequently, the variable fits the regression model independently (Table 9).

Table 9.
Parameter estimates to obtain regression coefficients

	Learning[a]	B	Error	Wald	gl	Sig.	Exp(B)
Under	Intersection	-8,150	17513,648	0,000	1	1,000	
	[Strategies for teaching = 1.00]	21,756	5388,251	0,000	1	0,997	2810097596,874
	[Strategies for teaching = 2.00]	-12,490	0,000	.	1	.	3,765E-6
	[Strategies for teaching = 3.00]	0c	.	.	0	.	.
Medium	Intersection	-20,59	1,225	282,749	1	0,000	
	[Strategies for teaching = 1.00]	19,378	5102,550	0,000	1	0,997	260360155,731
	[Strategies for teaching = 2.00]	2,773	1,289	4,629	1	0,031	16,000
	[Strategies for teaching = 3.00]	0c	.	.	0	.	.

a. dependent variable: learning achievement.
Source: Own elaboration.

According to the high level as the reference category, and having the low and medium level as comparison criteria, the sig. coefficients that best explain the multinomial regression of learning achievement were those of the variable Teaching strategies at the medium level, with a sig. of .031.

Specific hypothesis test 1

HA: Teaching strategies impact students' attitudinal learning achievement.

at a private university in Huancayo (2023).

Ho: Teaching strategies do not affect the attitudinal learning achievement of students in a private university in Huancayo (2023) (Table 10).

Table 10.
Model fit information

	Model fit criteria	Chi-square likelihood ratio tests	gl	
Model	Logarithm of the likelihood -2		Sig.	
Intersection only	49,572			
Final	13,868	35,704	8	0,000

Source: Own elaboration.

The closest statistical valuation to the ideal adjustment of the measure was given by the degree of Sig. found, which in this case was 0.000, which, being <0.05, shows the acceptance of the alternative hypothesis and the rejection of the null hypothesis; therefore, teaching strategies influence the attitudinal learning achievement of students in a private university in Huancayo (2023) (Table 11).

Table 11.
Table of independent likelihood ratio tests

	Model fit criteria	Chi-square likelihood ratio tests		
Effect	Logarithm of the likelihood -2 of small model		gl	Sig.
Intersection	13,868a	0,000	0	.
Teaching strategies	29,899	16,031	4	0,003

Source: Own elaboration.

When measuring the model independently, we used the same method given by the log likelihood, which gave us a Sig. coefficient of 0.003 for the independent variable Teaching strategies and, when comparing these data with the Sig. values given by the rule (<0.05), they are statistically significant; consequently, the variable fits the regression model independently.

The independent impact of each level was then assessed, according to the multinomial regression coefficients of the model (Table 12).

Table 12.
Parameter estimates to obtain regression coefficients

Attitudinal learning		B	Error	Wald	gl	Sig.	Exp(B)
Under	Intersection	-35,993	1,275	796,77	1	0,000	
	[Strategies for teaching = 1.00]	37,658	9010,917	0,000	1	0,997	22637553778573588,000
	[Strategies for teaching = 2.00]	16,085	0,000	.	1	.	9678497,512
	[Strategies for teaching = 3.00]	0c	.	.	0	.	.
Medium	Intersection	-35,886	0,271	17540,234	1	0,000	
	[Strategies for teaching = 1.00]	37,383	9010,917	0,000	1	0,997	17181252842405914,000
	[Strategies for teaching = 2.00]	18,321	0,000	.	1	.	90478181,128
	[Teaching Strategies = 3.00]	0[c]	.	.	0	.	.

a. The reference category is high.
Source: Own elaboration.

According to the high level as the reference category, and having the low and medium level as the comparison criteria, the Sig. coefficients that best explain the multinomial regression of learning achievement were those of the variable Reading Comprehension at the low level, with a Sig. of 0.000 and also at the medium level with a Sig. of 0.000, qualifying both as statistically significant for being <0.05.

Specific hypothesis test 2

HA: Teaching strategies affect students' conceptual learning achievement at a private university in Huancayo (2023).

Ho: Teaching strategies do not affect the achievement of conceptual learning of students in a private university in Huancayo (2023) (Table 13).

Table 13.
Model fit information

	Model fit criteria	Chi-square likelihood ratio tests		
Model	Logarithm of the likelihood -2		gl	Sig.
Intersection only	49,353			
Final	18,908	30,446	8	0,000

Source: Own elaboration.

The closest statistical valuation to the ideal adjustment of the measure was given by the degree of Sig. found, which in this case was 0.000, which shows the acceptance of the alternative hypothesis and the rejection of the null hypothesis; therefore, teaching strategies affect the achievement of conceptual learning of students in a private university in Huancayo (2023) (Table 14).

Table 14.
Table of independent likelihood ratio tests

	Model fit criteria	Evidence of the reason for		plausibility
Effect	Logarithm of the likelihood -2	Chi-square	gl	Sig.
Intersection only	18,908a	0,000	0	.
Final	35,452	16,544	4	0,002

Source: Own elaboration.

When measuring the model independently, using the same method given by the Log. likelihood, which gave us the Sig. coefficient of 0.002 for the independent variable Teaching strategies and, when comparing these data with the Sig. values given by the rule (<0.05), it is statistically significant; consequently, the variable fits the regression model independently.

Next, the independent impact of each level is assessed, according to the multinomial regression coefficients of the model (Table 15).

Table 15.
Parameter estimates to obtain regression coefficients

	Conceptual learning	B	Error	Wald	gl	Sig.	Exp(B)
Under	Intersection	-33,583	2636,273	0,000	1	0,990	
	[Strategies for teaching = 1.00]	14,027	2636,273	0,000	1	0,996	1235917,150
	[Strategies for teaching = 2.00]	15,357	2636,273	0,000	1	0,995	4671260,253
	[Teaching Strategies = 3.00]	0c	.	.	0	.	.
Medium	Intersection	-17,458	1,225	203,196	1	0,000	
	[Strategies for teaching = 1.00]	-17,191	1237,872	0,000	1	0,989	3,420E-8
	[Strategies for teaching = 2.00]	0,374	1,264	0,088	1	0,767	1,454
	[Strategies for teaching = 3.00]	0c	.	.	0	.	.

a. The reference category is high.
Source: Own elaboration.

According to the high level as the reference category, and having the low and medium level as the comparison criteria, the Sig. coefficients are the ones that best explain the multinomial regression of learning achievement, qualifying as statistically significant for being <0.05.

Specific hypothesis test 3

HA: Teaching strategies affect the achievement of procedural learning of students in a private university in Huancayo (2023).

Ho: Teaching strategies do not affect students' achievement of procedural learning at a private university in Huancayo (2023) (Table 16).

Table 16.
Model fit information

	Model fit criteria	Evidence of the reason for		plausibility
Model	Logarithm of the likelihood -2	Chi-square	gl	Sig.
Intersection only	50,992			
Final	16,381	34,611	8	0,000

Source: Own elaboration.

The closest statistical valuation to the ideal adjustment of the measure was given by the degree of Sig. found, which for this case was 0.000, which shows the acceptance of the alternative hypothesis and the rejection of the null hypothesis; therefore, teaching strategies affect the achievement of procedural learning of students in a private university in Huancayo (2023) (Table 17).

Table 17.
Table of independent likelihood ratio tests

	Model fit criteria	Likelihood ratio tests		
Effect	Logarithm of the likelihood -2	Chi-square	gl	Sig.
Intersection	16,[381a]	0,000	0	.
Teaching strategies	26,470	10,089	4	0,039

Source: Own elaboration.

Regarding the evaluation of the measurement of the model independently, using the same method given by the log likelihood, which gave us the Sig. coefficients of 0.039 for the independent variable Teaching strategies and, when comparing these data with the Sig. values given by the rule (<0.05), it is statistically significant; consequently, the variable adjusts to the regression model independently.

The independent impact of each level was then assessed, according to the multinomial regression coefficients of the model (Table 18).

Table 18.
Parameter estimates to obtain regression coefficients

Procedural learninga		B	Error	Wald	gl	Sig.	Exp(B)
Under	Intersection	-32,755	4347,980	0,000	1	0,994	
	[Strategies for teaching = 1.00]	17,116	1,535	124,337	1	0,000	27135639,896
	[Strategies for teaching = 2.00]	15,307	0,000	.	1	.	4442394,047
	[Teaching Strategies = 3.00]	0b	.	.	0	.	.
Medium	Intersection	-18,278	2430,903	0,000	1	0,994	
	[Strategies for teaching = 1.00]	17,057	2430,903	0,000	1	0,994	25568055,884
	[Strategies for teaching = 2.00]	17,585	2430,903	0,000	1	0,994	43337970,381
	[Strategies for teaching = 3.00]	0b	.	.	0	.	.

a. The reference category is high.
Source: Own elaboration.

According to the high level as the reference category, and having the low and medium level as the comparison criteria, the Sig. coefficients that best explain the multinomial regression of learning achievement were those of the variable Teaching strategies at the low level, with a Sig. of 0.000, qualifying this as statistically significant for being <0.05.

Discussion

The first proposal refers to the fact that teaching strategies have an impact on the achievement of significant learning by students in a private university in Huancayo (2023). In this sense, this hypothesis was accepted, given that the Sig. coefficient found was 0.000, being statistically significant for being <0.05. On the other hand, in the descriptive data with respect to the Teaching Strategies variable, a low level of 9 %, a regular level of 37 % and a high level of 54 % were found, while with respect to the Reading Comprehension variable, a low level of 13 %, a regular level of 84 % and a high level of 4 % were found, and with respect to the Learning Achievement variable, a low level of 5 %, a regular level of 79 % and a high level of 17 % were found.

These findings are similar to those discovered by Obloberdiyevna and Odilkhonovna (2022, p. 109), who found that educational strategies in relation to the use of information technologies and communicative interaction between peers are together effective actions to achieve learning achievements in students, this, in turn, favors the identification of the particularities, strengths and adaptations of students to the proposed educational models. In this sense, the authors were able to prove that the continuous implementation of teaching strategies around learning helped students with the learning of a non-native language in accordance with their pace of academic progress outside that course.

This is supported by Valenzuela and Barrios (2020, p. 855), who state that the teaching process is fundamental for the implementation of teaching strategies to improve pedagogical practice. In this sense, reading comprehension in courses related to the area of communication tends to have a greater emphasis and speed when it is focused on an active methodology before, during and after the teaching process.

Similarly, it is interesting to note that Amaluisa-Rendón et al. (2022, p. 201), who refer that teaching strategies are used selectively and freely by learners to optimally conclude the development of learning and increase students' abilities and attitudes. In reality, learning is a natural part of people, what happens is that many times this is lost and it is required to establish a domain to promote people's learning. For Are- llano (2016, p. 76), teaching strategies refer not only to a series of activities, but also to the teacher's intention to support learners, direct them and awaken their interest in learning, and that this activity is beneficial for academic development. Diaz Barriga Arceo and Hernandez Rojas (2007, p. 116) also mention that this guidance support must be evidenced in the learning processes, which, in turn, must be linked to the resources that are usually used for the achievement of these processes.

The second proposal was that teaching strategies affect students' active learning achievement at a private university in Huancayo (2023). This hypothesis was also accepted, since the Sig. coefficient found was 0.000, which is <0.05, making it statistically significant. On the other hand, the descriptive data for the Attitudinal Learning dimension showed a low level of 6%, a fair level of 61% and a high level of 33%.

These findings are similar to those found by Oktorianisarry et al. (2023, p. 25), who were able to identify that students' learning improvement achievements and attitude for learning were obtained through the use of reinforcement strategies and extracurricular implementations. The results showed that through these mechanisms it was possible not only to strengthen teachers' teaching strategies, but also to develop collaborative actions that favored reading comprehension and production and, of course, a better attitude for learning in students who previously had learning difficulties.

Similarly, Hinojosa-Mamani (2023, p. 12) found significant evidence in her findings on the use of virtual strategies for student learning, for this reason she concluded that virtual programs related to teaching have a greater impact on the development of student learning, so it is important to strengthen digital and communicative competencies in teachers because this generates benefits for students. This is supported by Aguado Molina and Villalba Salvador (2020, p. 351), who determine the situation of convenient understanding as the implementation of a fundamental didactic sequence for the use of strategies that facilitate mutual interaction between learners and students, as well as it is conducive to know the topics developed. For this reason, and in order to have traceability of this activity, it is required that people see it and can understand it, as this is considered a great support for understanding and learners, which in turn becomes a strategy for the advancement of society (Barrantes Torres, 2015, p. 291).

This position is complemented by Cusihuamán Sisa and Pacheco Rodríguez (2022, p. 87), who refer to attitudinal learning as the interactive process, oriented by the attitude or predisposition of the individual.

proactive attitude of the participants to learn. Through this predisposition, individuals focus on academic activities that strengthen the dialogue among all and correspond to discussions on different casuistry, that is, they are more willing to participate in the communication among individuals, which allows them to maintain directionality in their learning process.

The third proposal refers to the fact that teaching strategies have an impact on the achievement of conceptual learning of students in a private university in Huancayo (2023). This hypothesis was accepted, given that a Sig coefficient of 0.000 was found, which is statistically significant at <0.05. On the other hand, the descriptive results showed that the dimension Conceptual Learning Achievement presented a low level of 18%, a regular level of 55% and a high level of 27%.

In relation to the above, we find Sánchez-Cotrina (2023, p. 5), who evidenced a high incidence among the teaching strategies given in the computer field to raise the dimensions of learning, demonstrating that the innovative factors derived from this type of strategies produce reflective results in students, which are conducive to the most representative conceptual learning styles and become essential to strengthen the self-regulation of students. Likewise, Romero (2019, p. 118) supports the idea that learning is like a technique that facilitates the predisposition of bridges between previous and new knowledge, and that is how learners should seek the significant assurance of knowledge and use the strategies available in the formative process. For Leijon et al. (2023, p. 616), the conceptual learning process occurs when individuals elaborate in a relevant way mental structures such as contents and specific relationships through the process of information analysis, to learn from the reality in which they develop on a daily basis; this type of learning focuses on the particularities of the environment and on the various situations and events.

It should also be considered that teachers strive and are committed to train students in the best way, for this purpose they use their strategies that allow learners to develop their new knowledge, whose ultimate purpose is that students can understand and abstract the topics taught, which serve as support in the relationship of connecting previous and current knowledge during the teaching process (Guerra, 2014, p. 224). This premise is supported by the findings of Vos- koglou (2022, p. 12), who refers that the acceptability in the use of different media and virtual resources facilitates the development of learning, since they encourage active participation that benefits the development of conceptual learning activities given in the sessions, as well as the forma- tive process of university students who project their learning to be professionals in their field.

The fourth proposal refers that teaching strategies have an impact on the achievement of students' pro-dimental learning in a private university in Huancayo (2023). This hypothesis was also accepted, since the Sig. coefficient found was 0.000, which is <0.05, making it statistically significant. Likewise, the descriptive results showed that the procedural learning achievement dimension presented a low level of 8%, a fair level of 61% and a high level of 31%.

This finding is related to Alcas et al. (2019, p. 41), who determined that metacognitive teaching strategies and text comprehension during academic activities influence the field of learning comprised by the activities, that is, the field of procedural learning that is included in the students' activities on a regular basis, this, in turn, implies a continuous improvement of this process, which is why the relevance of proposing and carrying out strategies is highlighted.

The main objective of the project is to develop viable strategies for teachers and university authorities to promote the optimal development of students' reading comprehension.

The findings of this proposal are supported by Araújo et al. (2022, p. 109), who highlight the importance of procedural learning that is closely related to the activities that are performed and carried out on a daily basis, which are essential for the development of these active and dynamic capabilities, so that this dimension of learning is gradually acquired through the practicality and skills of each individual. In this order of ideas, we have Horna Sinfuegos (2022, p. 103), who refers that the capacity that individuals possess for textual interpretative achievement is usually understood as the achievement of conceptual development and inference of the points of view that explanatory arguments contain. 116) indicate that reading comprehension is predisposed to the understanding of a written document and more than a skill to understand, it is a competence that is developed through teaching strategies, whose development allows students to analyze and relate the assimilated texts to achieve the determined purposes, and thus put into practice the contents read in the teaching-learning process.

Conclusions

It is concluded that there is an incidence of teaching strategies in the learning achievement of students in a private university in Huancayo (2023), given that a Sig. coefficient of 0.000 was found, which was statistically significant because it was <0.05. Likewise, the variability of learning achievement was explained in 57.1 % by the independent variable. In this sense, the importance of teaching strategies in the formative process should be emphasized, which should be forged from the collaborative approach so that teachers can improve their pedagogical and scientific practice, which will contribute significantly to raise the motivational interest of the student and ensure the achievement of significant learning reflected in the continuous improvement of skills and abilities.

It is inferred that there is an impact of teaching strategies on the achievement of conceptual learning of students in a private university in Huancayo (2023), given that a coefficient of
<The coefficient of explanation of the conceptual learning achievement dimension was also obtained, being 35.0 % in relation to the predictor variable. In this sense, the modification and acquisition of competencies in students as a product of the teaching-learning process should initially strengthen the conscious, coherent and pertinent construction or elaboration of complex mental structures that are embodied in the contents and conceptual relations that entail learning in reality.

It is concluded that there is an incidence of teaching strategies in the procedural learning achievement of students in a private university in Huancayo (2023), since a Sig. coefficient of 0.000 was found, which was statistically significant because it was <0.05. Likewise, the variability of the Procedural Learning Achievement dimension was explained in 40.6 % by the predictive variable. In this sense, the set of pedagogical and educational actions that the teacher develops to concretize what is to be learned should be complemented with practical, active and dynamic activities, which, when carried out on a daily basis, develop and consolidate the skills that characterize a future professional.

It is deduced that there is an incidence of teaching strategies in the attitudinal learning achievement of students in a private university in Huancayo (2023), since a significance coefficient of 0.000 was found, being this <0.05, it was also possible to explain the variability of the dimension Attitudinal learning achievement in 42.3 % by the predictor variable. In this sense, to affirm that a student has achieved learning is because he/she has assimilated contents, developed skills (abilities and capacities) and expressed balanced educational and socioemotional attitudes that allow him/her an adequate interrelation in his/her educational, social, cultural, professional environment, etc., which should be lasting and stable.

Conflicts of interest

The authors of this article declare the non-existence of possible conflicts of interest that may arise in relation to the article submitted for publication and that may involve third parties.

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