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Continuous Training in Pedagogical Practice in Students of a Public Pedagogical Institute

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ABSTRACT: The purpose of this research was to determine how continuing education influences the teaching practice of students at the Pichari Public Pedagogical Institute, La Convención, Cusco, 2026. The study was conducted using a quantitative approach, using a non-experimental design and an explanatory level. The sample consisted of 80 graduates from the institute. The results demonstrated a statistically significant influence, leaving no room for doubt regarding the influence of continuing education on teaching practice (chi-square = 30.336; $p = 0.000$), explaining 38.7% of the variability in continuing education. Similarly, the study demonstrated a positive impact on didactic planning (41.4% influence; $p = 0.000$), while no significant effect was found on teaching delivery (2.9%; $p = 0.431$) and learning assessment (7.5%; $p = 0.084$). It was concluded that, while continuing education supports pedagogical practice in its planning dimensions, there are weaknesses in its impact on the implementation and evaluation of pedagogical practice that justify the redesign of comprehensive and contextualized continuing education programs. Research on continuing education recommended strengthening training strategies with a comprehensive approach that articulates theory and practice and contributes to improving the quality of future teaching performance.

1. INTRODUCTION

This study was linked to the sustainable development goal by addressing continuous training as a fundamental axis to strengthen quality in pedagogical practice in students graduated from pedagogical institutes. Likewise, it directly impacts on improving the learning of future professionals in education, contributing to an inclusive, equitable and quality educational education in our country, especially in contexts of teacher training at different higher educational levels, such as pedagogical institutes and universities. It is important to recognize that higher education students face challenges, typical of rural and multicultural contexts, which require teacher preparation that is constantly updated. In this sense, continuous training seeks constant updating and improvement of knowledge, skills, and competencies throughout professional life, with the aim of adapting to changes, improving academic performance, and promoting personal, professional, and pedagogical growth. Pedagogical practice, therefore, is not only understood as a formative stage, but as a space for the reflexive application of the

knowledge acquired, allowing for improved intervention in the classroom and responding to the diverse needs of the educational environment. [1], [2]

Internationally, the training for continuous improvement in pedagogical practice has presented complexities, especially in Latin America, where the existence of educational and technological gaps creates unequal access to opportunities for professional updating. It has been said that the absence of inclusive strategies in the initial training of teachers has resulted in a decline in the quality of the teaching provided, especially in rural and Indigenous communities [3]. It is also mentioned that the permanent training of the education systems of countries such as Bolivia, Honduras and Peru does not have cultural relevance and territoriality, which has resulted in a decrease in the preparation of future teachers [4]. Finally, it has been warned that the low investment in teacher training, taking into account the diversity of contexts, has led to processes of pedagogical practice disconnected from real needs [5].

At the national level, Peru had important limitations in the articulation between continuing education and pedagogical practice in public pedagogical institutes. The Ministry of Education recognized that students in initial training did not have systematic mechanisms to strengthen their professional skills during internships [6]. According to the National Institute of Statistics and Informatics, more than 45% of students at pedagogical training institutes in regions such as Cusco and Puno reported deficiencies in training support and limited connection between theory and classroom reality [7]. For its part, the Ombudsman's Office observed that national guidelines for continuous teacher training were not implemented in a homogeneous manner, generating inequalities between urban and rural institutes [8]. Likewise, researchers warned that students in the internship stage showed difficulties in applying updated pedagogical approaches due to the limited training and follow-up received in their training institutions [9].

In the local context, the Public Pedagogical Institute of Pichari, in the Convention – Cusco, presented significant obstacles in the implementation of efficient continuous training for students who carried out their pedagogical practice. The complementary training activities were punctual, poorly contextualized and lacked an articulated approach to the educational demands of the Amazonian rural area. Many students did not have the permanent support of trained tutor teachers, which limited their ability to critically reflect on their performance in the classroom. Added to this was the limited technological infrastructure, the scarce access to specialized bibliography, and weak institutional coordination to integrate continuous training as an essential part of the training process. These conditions negatively affected the quality of pedagogical practices, which limited the educational impact in the institutions where students carried out their pre-professional experience.

In this sense, the research question was framed as follows: As a general problem, how does continuous training influence pedagogical practice in the students of the Public Pedagogical Institute, Pichari in the Convention – Cusco, 2026? On the other hand, the specific questions were: How does the continuous training influence the didactic planning, the execution of the teaching and the assessment of the learning of the students of the Public Pedagogical Institute, Pichari in the Convention – Cusco, 2026?

Regarding justification, this research was pertinent from theoretical perspective, as it allowed a deeper understanding of continuing education as an essential process for the professional strengthening of teachers, framed in specific sociocultural contexts. From a practical perspective, the research identified how continuous training affects the quality of pedagogical practice, contributing to sustaining improvements in training programs and facilitating the adaptation of contextualized and relevant pedagogical strategies. Methodologically, an explanatory quantitative method was used, with a non-experimental design, which allowed determining the influence of continuous training on pedagogical practice.

The general objective of this research was to determine how continuous training influences pedagogical practice in students at the Public Pedagogical Institute, Pichari in the Convention – Cusco, 2026. From this, specific objectives were proposed to define how continuous training influences didactic planning, teaching execution, and learning assessment in students of said institute.

The national background considered in this study was as follows: In [10], analyzed the relationship between continuing education and teacher performance. The study was conducted under a quantitative, descriptive, and correlational approach. A questionnaire was used as a data collection instrument, applied to a non-probabilistic sample of 32 teachers. The results showed a Spearman correlation coefficient of $R = 0.617$, indicating a moderate positive relationship between the variables. It was concluded that continuous training significantly influences teacher performance.

In [11], specified that the objective was to determine the impact of this management on teaching practice in a school of education in Sicuani. An applied methodology was used, with a quantitative approach, hypothetical-deductive method, explanatory level, and non-experimental design. The results, analyzed using ordinal logistic regression, showed that the management of continuing education significantly predicts teaching practice (significance = 0.000) with an influence value of 59.5 % and 70.2 % of the variability in teaching practice, according to the Cox and Snell and Nagelkerke indices. It was concluded that there is a positive influence between both variables.

In [12], stated that the research aimed to determine the relationship between continuous training and educational quality. It was developed under a quantitative approach with a correlational design. The effects revealed a correlation coefficient of 0.860 and a reciprocal impact of 0.000, indicating a high and significant positive correlation between continuing education and educational quality. It was concluded that greater continuous training is associated with better educational quality in the teachers evaluated.

In [13], established that the objective was to determine the link between lifelong learning and the pedagogical practice of teachers in education in the unitary school units of Ayacucho. It applied a quantitative approach with a correlational design and a survey applied to 50 teachers. The results showed significant correlations between the level of lifelong learning and the efficiency of pedagogical practice; therefore, it was concluded that a higher degree of continuous training of teachers corresponds to better planning, evaluation, and pedagogical application.

The international background considered in this study was as follows: The study conducted by [14] sought to examine the connection between the professional development of teachers and their educational work in inclusive education environments. Through a systematic review of scientific literature, the way in which continuous training focused on inclusion affects pedagogical practice was analyzed. As a result, the positive impact that continuous professional development in inclusion has on the educational work of teachers was observed, promoting various didactic strategies more adapted to the diversity of students. It was concluded that teacher training focused on inclusion is one of the cornerstones to develop effective pedagogical practices in heterogeneous contexts, insisting on the need for more inclusive training.

The study by [15] emphasized the convergence of the continuous training received by teachers in Brazil and its eventual practice in the professional space, using a descriptive design, with a mixed approach, of an applied type, using questionnaires, to carry out an analysis of the training programs. The results have made it evident that the initial training of teachers is more focused on scientific and technical content than on pedagogy, which has meant that the professional practice of teachers does not stand out for its pedagogical component. Training concluded that continuous training through procedures that implement critical reflection of pedagogical practice helps to improve.

In [16], aimed to examine the use of academic portfolios as an innovative resource for the initiation of mathematics teacher training. The methodology followed a quantitative approach of applied type, corresponding to integrating portfolios in university mathematics courses and reviewing their impact on teacher training. The results indicated that the use of portfolios increased student engagement and allowed formative evaluation, concluding that the use of portfolios contributes to closing the gap between theory and practice and favors meaningful learning applicable to real educational contexts.

In [17], focused on the impact of professional development programs on pedagogical effectiveness and teachers' professional growth. Using a quantitative and applied methodology, their study emphasized that well-designed programs foster both disciplinary and pedagogical knowledge, enhancing teacher motivation. They concluded that implementing continuous training programs considering individual characteristics of teachers positively impacts educational quality.

In [18], analyzed empirical research on professional development of preschool teachers in Latin America, including studies indexed in Scielo, Scopus, Ebsco and Dialnet . The results of their study showed that continuous training directly affects the change of pedagogical practice and improves professional performance. They concluded that continuous training programs have a positive effect on teaching practice and professional development.

The concept of continuous training was first introduced in the education sector by UNESCO [19] with the report *Learning to Be* (1972) by Faure, where the need for lifelong education adapting to social, technological and cultural changes is emphasized.

Continuous training, according to [20] "is the set of processes of systematic and organized improvement, beyond education in the classroom, to satisfy social and labor demands through constant updating." Continuous training is defined by [21] as a

process of professional development that encourages critical reflection and transformation of teaching practices, while [22] states that it is a lifelong learning process and a strategic element to optimize the quality of teaching.

Continuous training is a process by which professionals learn, unlearn and update knowledge, skills and competencies throughout life. It is crucial in a knowledge society, in which rapid changes of technology and society require continuous adjustment [23]. Continuing education is therefore defined as a formal and informal learning activity that provides professional competence [24]. Furthermore, it is a mechanism of ethical and professional development that encourages new competences, personal growth and adaptation to new challenges [25].

This learning model, known as Practitioner Integrated Learning, facilitated by a professional, has been proven to bridge education and practice, thus promoting real learning and knowledge transfer [26]. From an organizational point of view, continuous professional development is also linked to the construction of professional identities and the strengthening of institutions through cycles of continuous learning [27]. Such views reflect diversity and the need for ongoing training in today's professional environments.

Teacher education is a permanent process that must be linked to the real context of the teacher to transform professional action through a critical, situated and reflective lens [28]. Therefore, teacher education must not be reduced to technical training, but must consider the socio-cultural context, foster critical reflection and aim at meaningful educational change. Thus, continuous training becomes a resource for professional development, educational improvement, and social justice. [29]

The first is the contextual dimension, proposed by Díaz Barriga [30], who emphasizes the importance of grounding teacher training in the sociocultural context in which the teacher works. Situated teaching involves retrieving the social and cultural meaning of what, how, and where teaching happens, an idea supported by [31] who says that contextual learning becomes important when related to real situations since knowledge is constructed through social interaction.

The second dimension, the reflective one, aims at developing teachers' critical and reflective stances towards their pedagogical practice, identifying strengths and weaknesses through self-analysis. According to [32], teacher reflection is a tool to understand and transform educational practice from a critical perspective, since it is understood that pedagogical knowledge is constructed through experience and the conscious analysis of one's own actions.

The third dimension, the professional, demonstrates the necessity of developing pedagogical, didactical and disciplinary skills in the classroom reality. Teachers should not only transmit theoretical knowledge but also acquire practical skills, so that they transform their practice. In [33] supports this, asserting that the professionalization of the teacher involves the acquisition of theoretical and practical knowledge that allows educators to interpret, intervene and critically transform their educational environments.

Finally, the ethical-critical dimension proposed by [34] demands commitment to educational transformation and social equity. This idea is reinforced by the perspective of [27], who emphasizes that training critical and committed teachers is to assume education as an ethical and political act that aims to transform reality and to build a just society.

The dependent variable pedagogical practice is seen as a reflective, dynamic and ethical process that involves sensitivity, moral intuition and responsibility towards students. In [18] calls it "pedagogical tact", which is the sensitivity of the educator in relation to the students, and that the lived experiences of the classroom and the growth of the teacher through coexistence are emphasized.

Thus, pedagogical practice is a set of strategies and approaches developed in the teaching-learning process, determined by educational theories and sociocultural contexts. This is an act that synthesizes ethics, reflection and transformation, where the teacher acts as a mediator of knowledge and promotes the holistic development of the student [35]. From an applied perspective, it serves as a bridge between theory and practice, enhancing professional preparation [36]. Furthermore, it is a historical and social phenomenon encompassing the knowledge, norms, and identities that shape educational relationships [37]. Finally, pedagogical practice must respond to the challenges of methodological innovation required by new social environments and contemporary educational demands [38].

Pedagogical practice, for [16], consists of the application of knowledge, but also of the critical analysis of didactic decisions in response to the context and the needs of students.

Pedagogical practice, as defined by [5], is that which intertwines, articulates, mixes theoretical knowledge, practical skills together with an ethical and social commitment. Pedagogical practice can be written in the form of a compendium of deliberate, reflective, and contextualized actions that the teacher carries out in the process of teaching; It thus extends from the planning of learning activities to the evaluation of the learning acquired.

On the other hand, this model of learning organized by professionals (Practitioner Integrated Learning) has shown its effectiveness in relation to the education process and practical experience, so that concrete learning and knowledge transfer have been favored [14]. From an organizational perspective, continuous professional development establishes a relationship with the construction of professional identities and the strengthening of organizations, through cycles of continuous learning [17]. These views stand out as a set of practices that point to the variability and needs of continuous training in current professional contexts.

According to [38], it is a continuous process that must be related to the real context of the teacher in order to transform his or her training action with a critical, situated, and reflective gaze. For this author, teacher training cannot be reduced to technical or instrumental training, but must contemplate the sociocultural environment of the teacher, stimulate critical reflection on his or her work, and be oriented towards significant educational change. Therefore, continuous training is understood as a resource for professional development, educational improvement, and social justice.

The first dimension expressed by [39], the contextual, refers to the fact that it must be grounded in the sociocultural context where the teacher carries out his/her work, taking into account the specificity of the environment. Likewise, situated teaching implies rescuing for teaching the social and cultural sense of what is taught, how it is taught, and the place where it is taught. This is confirmed by [40], who mentions that contextual learning takes on greater meaning when it is linked to real situations and authentic contexts, since knowledge is not built in isolation, but in interaction with the student's sociocultural environment.

The second dimension evidenced by [41], the reflective one, seeks to promote the critical and reflective attitude of the teacher regarding his pedagogical practice, thus recognizing his strengths and weaknesses, where the teacher must build knowledge from his experience, carrying out a critical analysis of his work in the classroom. In turn, [42] mentions that teacher reflection allows us to understand and transform educational practice from a critical perspective, recognizing that pedagogical knowledge is built from experience and the conscious analysis of one's own actions.

The third dimension, according to [43], the professional, expresses the intention of contributing to the development of pedagogical, didactic, and disciplinary competencies in relation to the reality of the classroom, thus training teachers without limiting themselves to transmitting theoretical knowledge, but rather directed toward providing knowledge that allows them to transform their practice. This is supported by [44], who states that teacher professionalization implies not only the acquisition of theoretical knowledge, but also the development of practical competencies that allow the teacher to interpret, intervene, and critically transform their educational reality.

Finally, the fourth dimension, according to [45], the ethical-critical, involves subjects in a commitment to educational transformation and social equity. The training of teachers with a critical sense and ethical responsibility through continuous training should promote the transformation of the school, not only the technical training of the teacher. This is endorsed by [46], who affirms that training critical and committed teachers implies assuming education as an ethical and political practice oriented toward the transformation of reality and the construction of a more just society.

Regarding the theory that supports the dependent variable, the origin of pedagogical practice is related to the reflective development of teaching as a dynamic and complex critical activity, incorporating sensitivity, moral intuition, and the responsibility of the educator toward students. One of the main theorists who approaches this origin from a phenomenological perspective is Max van Manen. According to [47], pedagogical practice is based on "pedagogical tact," which refers to the sensitivity of the educator when interacting with students, emphasizing the lived experience in the classroom and the growth of the teacher through coexistence with students.

Pedagogical practice is a set of strategies and approaches that the teacher applies within the framework of the teaching-learning process, identified with educational theories built in defined social and cultural contexts. In this sense, it is understood as a fact where ethics, reflection, and transformation are involved, and in which the teacher operates as a mediator of knowledge and promoter of the integral development of the student body [48]. From an applied perspective, it

establishes a space where theory and exposed practice can be articulated and favors the professional preparation of teachers [49]. In addition, pedagogical practice is also a historical and social fact, a chain in which the knowledge, norms, and identities that prescribe or direct educational relations are found [50]. Our educational reality also requires a pedagogical practice capable of responding to the challenges of methodological innovation that affect new ways of understanding and implementing new social environments and contemporary educational demands [51]. In this way, it is understood as a vital process that promotes the professional development of teachers and the improvement and permanent construction of the education system itself.

Pedagogical practice, for [52], consists of the application of knowledge but also of the critical analysis of didactic decisions in response to the context and the needs of students. Pedagogical practice, as defined by [53], intertwines theoretical knowledge and practical skills together with an ethical and social commitment. Pedagogical practice can thus be written as a compendium of deliberate, reflective, and contextualized actions that the teacher carries out in the teaching process, extending from the planning of learning activities to the evaluation of learning outcomes.

For [32], pedagogical practice is not merely the application of pedagogical techniques but a social and critical practice that highlights the conceptions by which knowledge, the learner, and society are understood; therefore, this practice is a space for educational construction and transformation that requires pedagogical, didactic, and ethical skills. In an operational sense, pedagogical practice concerns three basic dimensions.

The first dimension, didactic planning, according to [23], establishes the advance organization of the teaching process that explicitly determines objectives, contents, methodological strategies, learning resources, and forms of evaluation, allowing teachers to foresee and adapt their teaching to the characteristics of their students and the educational context. Likewise, [20] mentions that didactic planning should not be understood as a simple programming of activities, but as a reflective and flexible process that allows the teacher to make informed decisions to adapt teaching to the needs of the context and their students.

The second dimension, execution of teaching, according to [26], refers to the implementation of pedagogical activities in the classroom, where the teacher uses strategies, controls the time and space of the student, increases active participation, becomes the scenario where didactic interaction is evident. This is supported by [30] who affirms that the teaching practice involves constant decision-making in real time, where the teacher must adapt strategies, promote active participation and reflect on his intervention to improve the educational process.

The last dimension is the learning assessment, which in [3] includes the processes through which information about the performance of the student is obtained, analyzed, and interpreted to make pedagogical decisions. This dimension should be continuous, formative and coherent with the objectives proposed in the planning process. In [13] also points out that evaluation should be understood as a continuous and formative process that allows obtaining relevant information to provide feedback on student learning and improve teaching in coherence with pedagogical objectives.

The continuous training in the pedagogical practice of the students of the public pedagogical institute of Pichari, in the Convention-Cusco, is a challenge and a key opportunity for educational development in the region. In a context like the VRAEM, where sociocultural realities have a direct influence on the educational process, the permanent updating of methodologies and access to relevant resources are vital elements for the training of competent and committed teachers. The success of this ongoing training will depend not only on the quality of the programs implemented, but also on the ability to adapt them to the specific needs of the community and on the creation of a collaborative learning environment that promotes pedagogical innovation and critical reflection on one's own practice. The professional development of future teachers throughout their careers is essential for an effective response to the educational challenges of the VRAEM and for building quality education for all.

Finally, on the basis of the theoretical background reviewed, the following general hypothesis is formulated: Continuous training significantly influences the pedagogical practice of the students of the public pedagogical institute of Pichari, in the Convention-Cusco, 2026. The following specific hypotheses are proposed: The continuous training has a great influence on the didactic planning, the realization of the teaching and the evaluation of the learning of the students of the public pedagogical institute of Pichari, in the Convention-Cusco, 2026. This hypothesis will be evaluated through the analysis of relationships between the dimensions of both variables and their respective indicators, seeking to generate empirical evidence that supports proposals for institutional improvement.

2.SYSTEM IMPLEMENTATION

Beyond the statistical confirmation that continuous training significantly influences didactic planning but shows weak influence on teaching execution and learning assessment, this research proposes a technological response capable of closing that gap in real time. We introduce the Adaptive Continuous Training and Reflective Practice Platform (ACT-RP), an artificial-intelligence-driven mentoring system that combines natural language processing of teachers' reflective journals with a predictive ordinal model of pedagogical practice, moving institutional decision-making from a retrospective, end-of-program survey toward continuous, individualized monitoring. The design of ACT-RP follows recent evidence on the integration of AI tools into teacher professional learning [16], [20], [24].

2.1 System Architecture

ACT-RP is organized into four layers that together turn a one-time pretest/posttest measurement into a continuous feedback loop between continuous training and pedagogical practice:

Capture layer: a mobile application through which students log brief reflective journal entries after each practicum session and complete short adaptive check-ins on didactic planning, teaching execution, and learning assessment.

AI reasoning layer: a natural-language-processing module that scores the sentiment and pedagogical focus of each journal entry, combined with an ordinal predictive model that estimates, for every dimension of pedagogical practice, the probability of a Low / Regular / Good classification, in the same logic as the Nagelkerke pseudo- R^2 and ordinal logistic regression procedures used in the inferential analysis of this study.

Adaptive mentoring layer: a recommendation engine that, whenever a dimension is predicted to drift toward a Low classification, automatically suggests a targeted micro-learning module (e.g., formative assessment design, classroom strategy simulation) instead of waiting for the next institutional training cycle.

Institutional analytics layer: a cohort-level dashboard that aggregates individual predictions into a heatmap of the three pedagogical practice dimensions, supporting the institution's decision to redesign continuous training programs in a comprehensive and contextualized way.

Table 1 summarizes the four layers, their main function, and the indicator of the study they support.

Table 1. Correspondence between the ACT-RP architectural layers, their function, and the study's indicators.

Layer	Main Function	Related Indicator
Capture	Reflective journal entries and adaptive check-ins after each practicum session	Independent Variable Questionnaire
AI reasoning	NLP scoring and ordinal prediction of pedagogical practice dimensions	Nagelkerke pseudo- R^2 / ordinal logistic regression
Adaptive mentoring	Personalized micro-learning recommendations triggered by predicted risk	Dependent Variable Questionnaire
Institutional analytics	Cohort-level heatmap to redesign continuous training programs	Institutional improvement proposals

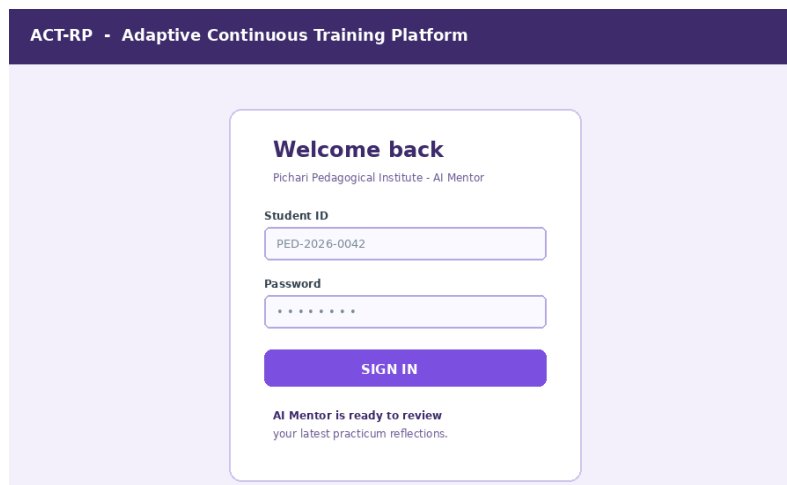


Fig. 1. Onboarding and sign-in screen of the ACT-RP mobile application used by Pichari Pedagogical Institute students.

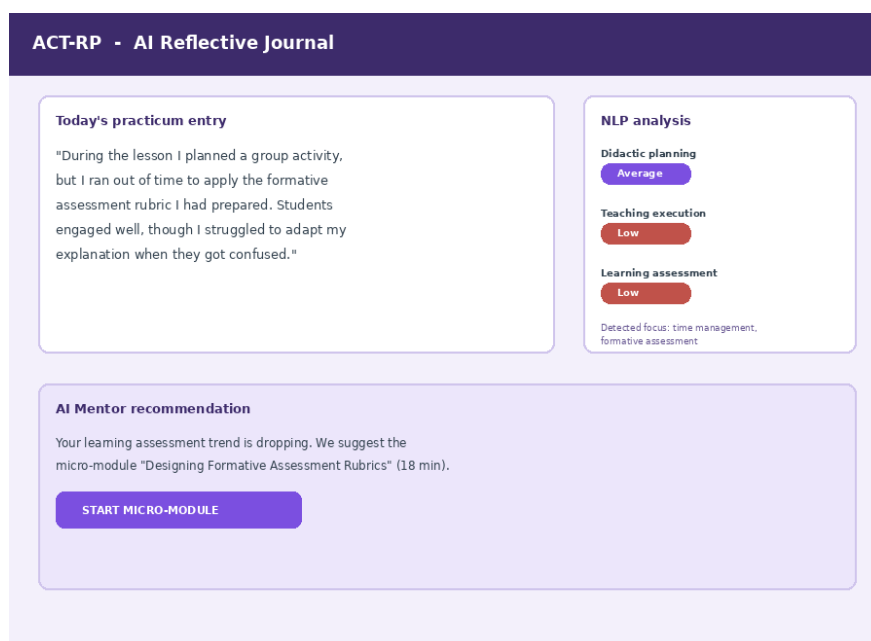


Fig. 2. AI-assisted reflective journal screen, where natural-language processing extracts pedagogical focus and sentiment from the student's practicum entry.

2.2 Predictive Algorithm

The AI reasoning layer is built around a per-dimension ordinal predictor that is re-evaluated after every new journal entry or check-in. Algorithm 1 describes its logic in pseudocode.

Algorithm 1: ACTRP_Predict(journal_text, checkin_scores, dimension)

Input: journal_text, checkin_scores[D1,D2,D3], dimension d

Output: level[d] in {Low, Average, High}, mentoring_action

1. sentiment_d $\leftarrow$ NLP_Sentiment(journal_text, d)
2. focus_d $\leftarrow$ NLP_TopicMatch(journal_text, d)
3. check_d $\leftarrow$ checkin_scores[d]
4. w1, w2, w3 $\leftarrow$ learned_weights[d]


```
5. // weighted combination, analogous to an ordinal logit
6. score_d ← w1*sentiment_d + w2*focus_d + w3*check_d
7. p_d ← Logistic(score_d)
8. if p_d < 0.50: level[d] ← Low
9. elif p_d < 0.75: level[d] ← Average
10. else: level[d] ← High
11. if level[d] == Low:
12. mentoring_action ← RecommendMicroModule(d)
13. return level[d], mentoring_action
```

The weighted sum in line 6 mirrors, at the level of an individual student, the same logic used in the study's ordinal logistic regression: journal sentiment and content act as covariates that, together with the structured check-in score, estimate the probability of each performance level. Because the algorithm performs a constant number of operations per dimension per entry, its time complexity is $O(1)$ with respect to the cohort size, allowing the platform to re-score all 80 students of the sample in real time as new entries arrive, and its space complexity is $O(d)$ for $d = 3$ pedagogical practice dimensions per student.

2.3 Reference Implementation

A minimal reference implementation of the predictor was coded in Python to validate the scoring logic before connecting it to the production NLP pipeline.

```
import math

def logistic(x: float) -> float:
    return 1 / (1 + math.exp(-x))

def predict_dimension(sentiment: float, focus: float, checkin: float,
                     weights: tuple[float, float, float]) -> dict:
    w1, w2, w3 = weights
    score = w1 * sentiment + w2 * focus + w3 * checkin
    p = logistic(score)

    if p < 0.50:
        level = "Low"
    elif p < 0.75:
        level = "Average"
    else:
        level = "High"

    action = recommend_micro_module(level)
    return {"probability": p, "level": level, "action": action}

def recommend_micro_module(level: str) -> str:
    if level == "Low":
        return "Trigger targeted micro-learning module"
    return "No immediate action required"
```

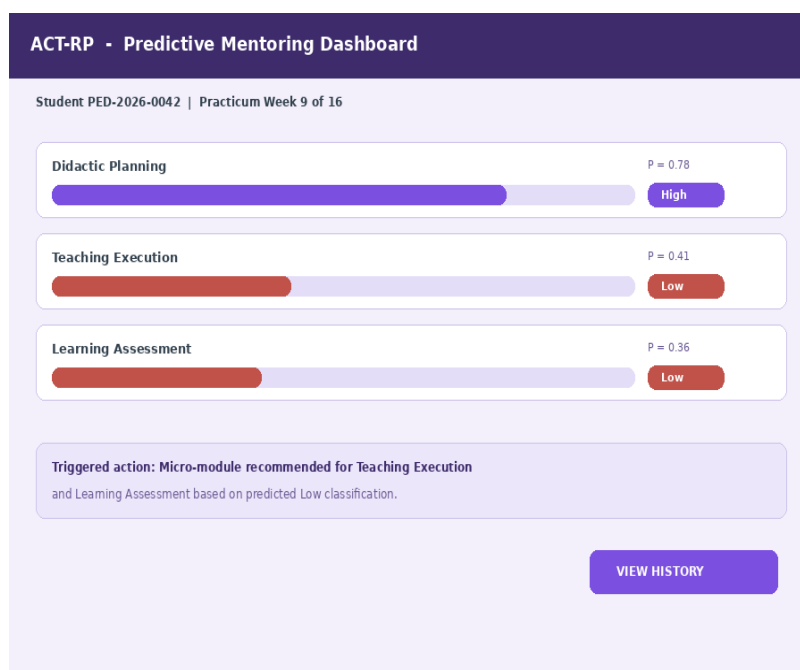


Fig. 3. Predictive mentoring dashboard showing the student’s estimated performance level for didactic planning, teaching execution, and learning assessment, with an automatically triggered micro-learning recommendation.

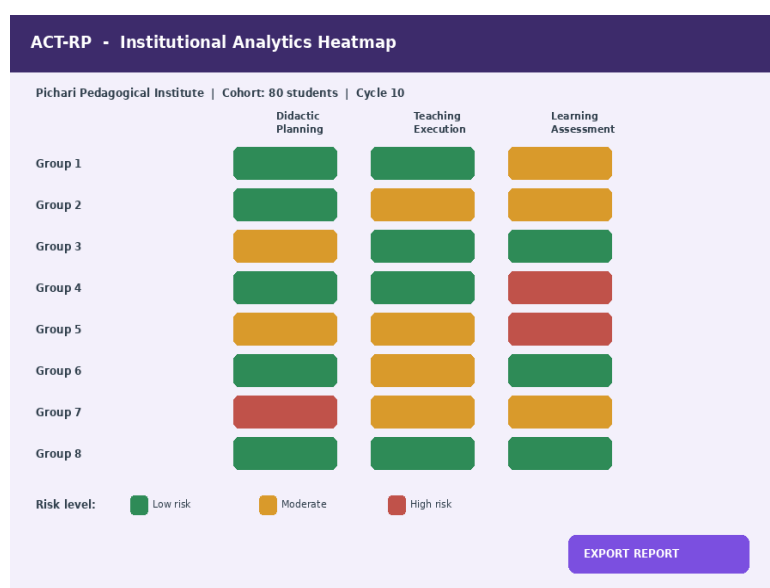


Fig. 4. Institutional analytics heatmap aggregating the 80-student cohort across the three pedagogical practice dimensions, used to prioritize the redesign of continuous training programs.

2.4 Implementation Limitations

ACT-RP is conceived as a continuous-monitoring complement to, not a replacement for, the cross-sectional statistical analysis reported in the Results section. The predictive model is a deliberately interpretable ordinal classifier rather than the formal chi-square, Nagelkerke pseudo- R^2 , and Wilcoxon-type procedures that establish the study’s confirmatory hypothesis tests; consequently, all conclusions about statistically significant influence continue to rest on those inferential analyses. Likewise, the natural-language-processing component analyzes self-reported reflective text, which can be subject to social-desirability bias, so its sentiment and focus scores should be interpreted as a complementary indicator rather than direct evidence of classroom practice. Future versions of ACT-RP could incorporate classroom-observation data and peer feedback, following emerging

evidence on AI-supported teacher professional vision and adaptive teaching [9], to validate and triangulate the journal-based predictions reported here.

3 METHODOLOGY

This research adopted a quantitative approach, which is characterized by the numerical analysis of data and the identification of patterns, as pointed out by [21], [26]. Regarding its nature, it is framed within basic type research, understood as aimed at expanding theoretical knowledge about a phenomenon without necessarily having an immediate practical application [29]. The methodological design will be non-experimental, which implies that the events will be perceived as they are presented in their natural context, without intervention or adjustment of variables, thus allowing the analysis and understanding of the experiences lived by the participants [33]. Finally, the hypothetical-deductive method was used, which according to [12], is based on the formulation of hypotheses and their subsequent contrast with the data obtained during the research process.

The independent variable, continuous training, was conceptualized by [4] as a continuous process that must be related to the real context of the teacher to transform his or her training action with a critical, situated, and reflective perspective. This variable is operationalized according to the theory of [12], who mentions four fundamental dimensions: contextual, reflective, professional, and ethical–critical. As for the dependent variable, pedagogical practice, it is conceptualized by [2] as a socially and historically situated practice that goes beyond the simple application of educational techniques. It involves a critical and reflective process in which teachers interpret, question, and transform the social, cultural, and political conditions that affect education. Likewise, this variable will be operationalized by [10] in its three dimensions: didactic planning, execution of teaching, and evaluation of learning. Both questionnaires used a Likert-type ordinal scale.

According to [25], [36], [40], the population is understood as the set of individuals who share certain characteristics and who, therefore, are relevant to be included within the scope of a given study. Thus, the present research will have a population made up of 100 tenth-cycle students at the Public Pedagogical Institute of Pichari, in the Convention–Cusco (2026), and its sample will be 80 students from the same institution, chosen through non-probabilistic convenience sampling. Regarding inclusion criteria, students who voluntarily agree to participate in the research were included, regardless of age; while exclusion criteria were applied to those students who did not enroll in this academic cycle in a public pedagogical institute, or who did not fully complete the application of the instrument.

In the research process, “technique” refers to the set of procedures and resources used for the collection of information, as [32] points out. In this research, data were collected through a survey since it allows data to be collected in a systematic and structured way [14]. The method for obtaining information consisted of the Independent Variable Questionnaire and the Dependent Variable Questionnaire, both structured under a Likert-type scale, which operates at an ordinal measurement level. According to [34], a measurement instrument is a tool that allows quantifiable or qualifiable information to be collected on specific variables and can take various forms, such as questionnaires, surveys, scales, or standardized tests, depending on the nature of the data sought. To ensure methodological quality, the instruments were reviewed and validated by experts in the area, who evaluated key aspects such as the clarity, coherence, and relevance of the items in relation to the dimensions analyzed [15]. Likewise, the reliability of the instruments was evaluated using Cronbach’s alpha coefficient, to verify the internal consistency of the scales used [24].

In this research, a series of statistical procedures were carried out aimed at the rigorous analysis of the data collected. In the first stage, descriptive statistics were applied to organize and represent the information through tables and graphs that allow the results obtained to be clearly visualized. Subsequently, in the field of inferential statistics, the distribution of the data was evaluated by means of a normality test according to Kolmogorov–Smirnov (KS). Based on the results of this test, the most appropriate procedure for the analysis of causal–explanatory correlational-level influence was determined. In this phase, the hypotheses raised were contrasted through the Nagelkerke Pseudo-Square coefficient or by ordinal logistic regression, depending on the nature of the variables involved. Finally, the corresponding hypothesis test was carried out, with the aim of establishing the significant influences between the variables studied.

The present study was approved by the César Vallejo University Ethics Committee, according to the procedures established in the University Council Resolution No. 0470-2022-UCV, to ensure strict adherence to the ethical protocols established for scientific research. Likewise, the fundamental principles of scientific integrity were applied throughout the research process. Among them, the principle of autonomy stands out, expressed through respect for the free and informed decisions of the participants, who signed an informed consent. Truthfulness, justice, and responsibility were also guaranteed in the execution

and dissemination of the results, adopting all necessary measures to prevent any harm. Finally, confidentiality and anonymity were ensured in the collection and handling of data, thus safeguarding the privacy and rights of the participants involved.

4 RESULTS

Table 2. Frequency Distribution Analysis: Continuing Education and Dimensions

Continuous Training			Contextual		Reflective		Professional		Ethical-Critical	
Level	f	%	f	%	f	%	f	%	f	%
Well	14	17.5%	32	40%	27	33.8%	26	32.5%	20	25%
Regular	66	82.5%	44	55%	49	61.3%	47	58.8%	60	75%
A little	0	0%	4	5%	4	5%	7	8.8%	0	0%
Total	80	100%	80	100%	80	100%	80	100%	80	100%

Table 02. The analysis of the distribution of teachers on the variable continuous training shows that teachers are at a regular level with (82.5%) is the most predominant, (17.5%) teachers are in good, and the bad level is without records. In the contextual dimension, 40% of the teachers have a good rating, 55% are average and 5% are poor teachers, which shows a partial interference with the educational environment. In the reflective dimension, 33.8% of the teachers are considered good, 61.3% are in average and 5% are poor, which shows a limitation in the development of critical thinking. In the professional dimension, 32.5% of teachers with a good rating, 58.8% average and 8.8% bad, have a negative perception, which denotes deficiencies in teacher updating. In the critical-ethical dimension, 25% have a good evaluation, 75% have a fair evaluation, and there are no bad evaluations, which indicates a weak ethical training, although present. The data obtained highlights the need to redesign continuous training with more comprehensive, critical, and relevant approaches to the current teaching practice.

Table 3. Frequency Distribution Analysis: Pedagogical Practice and Dimensions

Pedagogical Practice			Didactic Planning		Teaching Execution		Learning Assessment	
Level	f	%	f	%	f	%	f	%
Well	6	7.5%	31	38.8%	13	16.3%	8	10%
Regular	74	92.5%	47	58.8%	63	78.8%	56	70%
A little	0	0%	2	2.5%	4	5%	16	20%
Total	80	100%	80	100%	80	100%	80	100%

Table 03. The analysis of the distribution of teachers in the variable pedagogical practice shows a high concentration at the regular level (92.5%), with 7.5% at the proficient level and no records at the bad level, which reflects an acceptable but not truly relevant pedagogical practice. Regarding the didactic planning dimension, 38.8% of the teachers rate it as good, 58.8% as regular and only 2.5% as bad, which indicates adequate planning, but with few areas for improvement. In terms of the dimension of teaching execution, most teachers (78.8%) perceive it at this regular level, 16.3% value it as good and 5% as bad, which shows weaknesses in the effective implementation of didactic strategies. Finally, regarding the learning assessment dimension, 10% perceive it as good, 70% as fair and 20% as bad, this being the dimension that has a negative rating in the highest percentage, and this also suggests serious limitations in the evaluation processes. The need to enhance pedagogical practice through training processes that integrate better planning, congruent execution and meaningful evaluation, aimed at improving educational quality.

Table 4. Normal Distribution Fit Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistical	gl	Sig.	Statistical	gl	Sig.
Continuous Training	,175	80	,000	,898	80	,000
Pedagogical Practice	,104	80	,000	,973	80	,005
a. Lilliefors Correction of Significance						

In table 4. The results of the analysis of the normality of the variables Continuing Education and Pedagogical Practice, in which the statisticians Kolmogorov-Smirnov and Shapiro-Wilk were used, indicated that both variables do not conform to a normal distribution. For the Continuing Education variable, the statistical values for both methods were significant (Kolmogorov-Smirnov = 0.175, $p = 0.000$; Shapiro-Wilk = 0.898, $p = 0.000$), in what corresponds to the rejection of the null hypothesis of normality. In the variable Pedagogical Practice, they were also significant (Kolmogorov-Smirnov = 0.104, $p = 0.000$; Shapiro-Wilk = 0.973, $p = 0.005$), although in the latter variable, the results were less deviated than for the Continuing Education variable. In addition, both p -values are below the significance level ($p < 0.05$) and continue if the Lilliefors correction is applied, which helps us to validate their statistical significance. The lack of normality we estimate that for future analyses, since, due to the lack of normality, we will have to use non-parametric tests, thus seeking to achieve greater precision in the interpretation of the data, and avoiding biases caused by the performance of careful parametric tests of due adequacy.

4.1 Inferential results

General Hypothesis

H0: Continuous training does not significantly influence the pedagogical practice of students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Ha: Continuous training significantly influences the pedagogical practice of students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Table 5. Variability Test of Continuing Education in Pedagogical Practice

Hypothesis	Variables	Logarithm of verisimilitude	Chi-square	Sig. Bilateral	Nagelkerke Pseudo Square	% influence x 100%
General Hypothesis	Continuing Education * Pedagogical Practice	7.599	30.336	0.000	0.387	38.7%

Table 5. The implementation of the variability test to inspect whether continuous training influences pedagogical practice, resulting in a statistically significant association. The Chi-square statistic obtained a value of 30.336, and in turn a bilateral significance of the probability of 0.000 allowed the rejection of the null hypothesis of variability, finding that continuous training influences pedagogical practice. The logarithm of likelihood (7.599) confirms the adequacy of the model and, as for the Nagelkerke Pseudo square, with a value of 0.387 indicates that the model explains 38.7% of the variability of continuous training in pedagogical practice, has a moderate percentage influence, highlighting the importance of having continuous training and pedagogical practice to improve the proposal, programming, execution and evaluation in the classroom. From a practical point of view, the results prove the need to strengthen continuing education programs as a basic element to positively influence the quality of pedagogical practice.

4.2 Specific Hypothesis 1

H0: Continuous training does not significantly influence the didactic planning in the students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Ha: Continuous training significantly influences the didactic planning in the students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Table 6. Variability Test of Continuing Education in Didactic Planning

Hypothesis	Variables	Logarithm of verisimilitude	Chi-square	Sig. Bilateral	Nagelkerke Pseudo Square	% of influence x 100%
Specific Hypothesis 1	Continuous Training * Didactic Planning	6.956	31.512	0.000	0.414	41.4%

Table 6. The test of variability between continuous training in didactic planning offers a statistically significant influence. The Chi-square statistic reaches a value of 31.512, with a bilateral significance of 0.000, which allows the decision to be made to reject the null hypothesis and suggests that continuous training has a direct impact on the way of planning didactics; the logarithm of the likelihood (6.956) shows that the fit of the model is correct, and the Nagelkerke Pseudo square of 0.414 shows that 41.4% of the variability in the way of planning didactics can be explained by continuous training and this level of influence offers a moderate association and reiterates the important role that professional updating has when carrying out the design and structuring of Teaching, that is, well-oriented continuous training, can have a favorable impact on the quality of the pedagogical planning proposal, favoring practices that are more contextualized, organized and coherent with the learning objectives to be achieved.

4.3 Specific Hypothesis 2

H0: Continuous training does not significantly influence the execution of teaching in the students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Ha: Continuous training significantly influences the execution of teaching in the students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Table 7. Variability Test of Continuing Education in the Execution of Teaching

Hypothesis	Variables	Logarithm of verisimilitude	Chi-square	Sig. Bilateral	Nagelkerke Pseudo Square	% influence x 100%
Specific Hypothesis 2	Continuing Education * Teaching Execution	9.721	1.683	0.431	0.029	2.9%

Table 7. The test of variability between continuous training in the execution of teaching shows low statistical influence. The value of the Chi-square statistics is 1.683, with a bilateral significance of 0.431, which leads us not to reject the null hypothesis and to conclude that it does not translate into evidence of a significant influence of continuing education on the execution of teaching. The calculated logarithm of likelihood is 9.721, and Nagelkerke's Pseudo square offers us a much lower value (0.029) by exposing us to a percentage of influence of continuous training of 2.9%. This minimum value forces us to conclude that the variability in teaching performance cannot be explained, at least largely in continuing education. Consequently, it should be concluded that factors other than training could be influencing in a much more decisive way when carrying out pedagogical strategies in the classroom. From a practical point of view, it may be recommended to review the parameters necessary to proceed with the adequacy of the relevance, quality, or application of the training contents to try to achieve a more direct impact on the execution of teaching.

4.4 Specific Hypothesis 3

H0: Continuous training does not significantly influence the Evaluation of learning in students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Ha: Continuous training significantly influences the Evaluation of Learning in students at the Public Pedagogical Institute, Pichari in the Convention -Cusco, 2026.

Table 8. Continuous Training Variability Test in Learning Assessment

Hypothesis	Variables	Logarithm of verisimilitude	Chi-square	Sig. Bilateral	Nagelkerke Pseudo Square	% influence x 100%
Specific Hypothesis 3	Continuing Education * Learning Assessment	10.896	4.946	0.084	0.075	7.5%

Table 8. The evidence that shows the variability between continuous training and learning assessment shows us a scarce and statistically non-significant influence. In the case analyzed, we weighed Chi-square = 4.946 and bilateral = 0.084, with a significance that exceeds the threshold of 0.05 of conventional scope, preventing us from rejecting the null hypothesis and suggesting that there is no clear effect of continuous training in the evaluation processes. The logarithm of likelihood is 10.896 and the Nagelkerke Pseudo square 0.075, such that only 7.5% of the variability in the assessment of learning can be explained by continuous training, with a slight trend, but which is insufficient to sustain the influence between both variables. All this leads us to consider the importance of reviewing the content and approach of the training that teachers receive and the effect that this may have on their evaluation practices in their own classroom, thus promoting much more specific and practical programs for the design, application and analysis of much more effective evaluation strategies.

5 DISCUSSION

The general hypothesis test confirmed that continuous training significantly influences pedagogical practice among students of the Pichari Public Pedagogical Institute (chi-square = 30.336; $p = 0.000$), explaining 38.7% of the variability in pedagogical practice according to the Nagelkerke pseudo- R^2 . This finding is consistent with [4], who reported a moderate positive correlation ($R = 0.617$) between continuous training and teaching performance, and [2], [5], who also found significant associations between continuing education and pedagogical or educational-quality outcomes. However, the magnitude observed here (38.7%) is considerably lower than the 59.5% to 70.2% influence reported by [9] for a comparable population in Sicuani. This contrast suggests that the rural, multicultural, and resource-constrained conditions of the VRAEM context described in the Introduction, sporadic, poorly contextualized complementary training activities and limited tutor support, likely attenuate the explanatory power of continuous training relative to settings with more consolidated institutional support.

At the dimension level, the results show a clearly uneven pattern. Continuous training significantly influenced didactic planning (41.4% of explained variance; $p = 0.000$), the dimension most directly tied to the conceptual, advance-organization side of teaching. In contrast, its influence on teaching execution (2.9%; $p = 0.431$) and learning assessment (7.5%; $p = 0.084$) was not statistically significant. This asymmetry mirrors the distinction drawn by [5], who found that teacher training programs in Brazil tend to emphasize scientific and technical content over the pedagogical component of practice, and by [33], whose review of professional development for Latin American preschool educators likewise found that sustained training transforms practice mainly when it is deliberately designed for that purpose. In the present study, the training activities received by Pichari students appear to have strengthened planning-related competencies, arguably easier to address through lecture-based or documentary training, while leaving the more performative, in-classroom components of teaching execution and the technically demanding process of learning assessment comparatively unaffected.

This interpretation is reinforced by international evidence on the design of effective professional development. In [41], [43], [48], [54], [55] converge on the same conclusion: professional development programs only translate into improved practice when they incorporate active, practice-based components, academic portfolios, simulation, supervised feedback, rather than relying on the transmission of theoretical content alone. The absence of a statistically significant effect on teaching execution and learning assessment in this study is therefore consistent with, rather than contradictory to, the broader literature: it signals a gap in the practical and evaluative components of the continuous training received, not a weakness of continuous training as a construct. Theoretically, this finding is coherent with [45] distinction between the contextual, reflective, professional, and ethical-critical dimensions of teacher formation, and with [27] view of pedagogical practice as a socially and historically situated process that exceeds the simple application of technique: planning can be improved through propositional knowledge, while execution and assessment require the kind of situated, reflective experience that a sporadic and poorly contextualized training offer, as described for the Pichari institute, struggles to provide.

5.1 Limitations

Several limitations should be considered when interpreting these results. First, the non-probabilistic convenience sample of 80 tenth-cycle students from a single public pedagogical institute restricts the generalizability of the findings to other regions or training modalities. Second, the non-experimental, cross-sectional design allows the identification of statistical influence but not of causal relationships between continuous training and pedagogical practice; longitudinal or quasi-experimental designs would be needed to track change over time. Third, both variables were measured through self-reported Likert-type questionnaires, which are susceptible to social-desirability bias and may not fully correspond to observed classroom behavior. Finally, the study was conducted in the specific sociocultural context of the VRAEM, so the comparatively low explanatory power found for teaching execution and learning assessment should not be generalized without considering the contextual constraints, limited technological infrastructure, scarce specialized bibliography, and weak institutional coordination, described in the Introduction. These limitations directly motivate the continuous-monitoring approach introduced in the System Implementation section, which complements retrospective self-report with real-time, AI-assisted reflective data.

6 CONCLUSIONS AND RECOMMENDATIONS

As indicated, continuous training has a significant impact on the pedagogical practice of students, thus being 38.7% ($p = 0.000$), which supports continuing to work in this sense, since it is what gives meaning to improve the proposal, execution and evaluation of the educational process.

Continuous training also has a significant impact on didactic planning, thus being a 41.4 % of explained variance ($p = 0.000$), a result that seals that the training processes help to improve the programming and pedagogical coherence of didactic delivery.

It was found that continuous training does not have a significant influence on the teaching execution process (2.9 % effect; $p = 0.431$), so it is determined that the knowledge imparted from continuous training does not affect the didactic strategies that are carried out in the classroom.

The influence between continuous training and learning assessment is not statistically significant (7.5% effect; $p = 0.084$), which highlights the gap between the knowledge obtained in training and that which is useful when learning assessment is required.

The institution must advance in the proposal of continuing education programs that deploy in a corresponding way the three pedagogical dimensions (planning, execution, and evaluation) under active methodologies and in accordance with the cases to be given at the local level.

It is necessary to strengthen the practical dimension that tends to the application of what has been given to be formed, thus promoting simulations of what is tended to be formed, reflective practice, micro-teachings and the observation of effective classes, thus producing the effect on teaching.

It is proposed to carry out specific training modules on formative assessment and authentic assessment as it assesses learning using objective and contextualized criteria that lead to a coherent and effective assessment of learning.

The institution must process the follow-up and monitoring of the effects of continuous training on pedagogical practices while carrying out a follow-up of indicators aimed at establishing the search for pertinent and sustained adjustments over time.

AUTHOR CONTRIBUTIONS

Jhonatan Huaman-Urbano: Conceptualization, Investigation.

Jose Luis Rojas-Díaz, Darwin Hoover Gutierrez-Alamo: Methodology, Laboratory Analysis.

Nerio Enriquez-Gavilan: Data Curation, Formal Analysis.

Naara Eunice Medina-Altamirano: Supervision, Writing—Review & Editing.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest related to this research, its authorship, or its publication.

ETHICS STATEMENT

Ethical approval was not required for this study.

DATA AVAILABILITY STATEMENT

The data presented in this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy and ethical restrictions protecting the identity of the student participants.

REFERENCES

- [1] A. C. Ximenes, V. Itacaramby Pardim, F. Carvalho, I. Yamamoto, and A. B. N. Viana, "The institutionalization of teacher training in business higher education as a consequence of pandemic experiences," *Account. Educ.*, vol. 34, no. 5, p. Article 34(5), 2025, doi: 10.1080/09639284.2025.2456149.
- [2] J. M. Dos Santos Dos Santos, C. A. Almeida Pereira Abar, A. M. Reis D'Azevedo Breda, and Z. Lavicza, "Automatic Feedback in Mathematics Education: A Pathway to Robotics and Computational Thinking | Feedback Automático na Educação Matemática: um Caminho para a Robótica e o Pensamento Computacional," *Acta Sci.*, vol. 27, no. 2, p. Article 27(2), Apr. 2025, doi: 10.17648/acta.scientiae.8240.
- [3] D. Guerra Simões and C. de Assis Olgin, "Reflections on Continued Training in Fractions: Influence on Teachers' Professional Development | Reflexões sobre a formação continuada em Frações: influência no desenvolvimento profissional dos professores," *Acta Sci.*, vol. 26, no. 1, p. Article 26(1), Jan. 2024, doi: 10.17648/acta.scientiae.7992.
- [4] M. Urbay Rodríguez, L. M. Campos Cardoso, A. M. Torres Alfonso, M. Rodríguez Carrillo, and A. Ruíz Díaz, "Pedagogical model for the training of competences in the university professional | Modelo pedagógico de formación de competencias en el profesional universitario," *An. La Acad. Ciencias Cuba*, vol. 14, no. 1, p. Article e1478, Jan. 2024.
- [5] J. M. Z. Al-Qudsi, "Developing the Academic Programs in Forensic Sciences: A Consistent Need to Achieve Professionalism in Forensic Work and to Serve the Criminal Justice," *Arab J. Forensic Sci. Forensic Med.*, vol. 4, no. 1, p. Article 4(1), 2022, doi: 10.26735/GBRD9487.
- [6] A. P. M. Jiménez and P. A. González-Moreno, "MOTIVATION AND CONTINUOUS TRAINING OF ART TEACHERS IN BASIC EDUCATION IN THE STATE OF CHIHUAHUA, MEXICO | MOTIVACIÓN Y FORMACIÓN CONTINUA DE DOCENTES DE ARTES EN EDUCACIÓN BÁSICA EN EL ESTADO DE CHIHUAHUA MÉXICO," *Artseduca*, no. 34, p. Article (34), Feb. 2023, doi: 10.6035/artseduca.6644.
- [7] B. Doria, V. Grion, F. Picasso, and L. Li, "Faculty assessment development in higher education: the CRAFT framework emerging from a systematic literature review," *Assess. Eval. High. Educ.*, vol. 51, no. 1, p. Article 51(1), 2026, doi: 10.1080/02602938.2025.2584121.
- [8] M. V. Sánchez, J. L. B. Condon, and M. del Henar Pérez Herrero, "Company tutors in Dual Vocational Training in the Principality of Asturias. An analysis of their competencies | Los tutores de empresa en Formación Profesional Dual en el Principado de Asturias. Un análisis de sus competencias," *Aula Abierta*, vol. 54, no. 1, p. Article 54(1), Jan. 2025, doi: 10.17811/rife.21590.
- [9] P. P. Chand, S. P. Chand, and K. K. Kumar, "Teachers' knowledge and practices in systematic Phonics instruction in Fiji's lower primary classrooms," *Aust. Educ. Res.*, vol. 53, no. 2, p. Article 35, Apr. 2026, doi: 10.1007/s13384-026-00955-4.
- [10] J. B. Argudo, "The School Library as a Formative Agent in Media and Information Literacy among Secondary Education Students: An Instrumental Case Study in a Secondary School in Barcelona | La biblioteca escolar com a agent formatiu en l'alfabetització mediàtica i infor...", *Bid*, no. 55, p. Article (55), Jan. 2025, doi: 10.1344/BID2025.55.08.
- [11] J. C. Trullàs, C. Blay, E. Sarri, and R. Pujol, "Effectiveness of problem-based learning methodology in undergraduate medical education: a scoping review," *BMC Med. Educ.*, vol. 22, no. 1, p. Article 104, Dec. 2022, doi: 10.1186/s12909-022-03154-8.
- [12] B. L. Benigno, S. M. O. Vasconcelos, and Z. G. E. Franco, "RURAL EARLY CHILDHOOD EDUCATION:

TEACHING IN MULTIGRADE CLASSROOMS IN THE HINTERLAND OF THE AMAZON | EDUCAÇÃO INFANTIL DO CAMPO: DOCÊNCIA EM TURMAS MULTISSERIADAS NO INTERIOR DO AMAZONAS,” *Cad. Cedes*, vol. 43, no. 119, p. Article 43(119), 2023, doi: 10.1590/255728.

- [13] E. A. Delgado Vela, “Teacher training policies as a cornerstone of educational improvement in public systems. A comparative international approach | Políticas de capacitación docente como eje de mejora educativa en sistemas públicos. Un enfoque comparativo internacional,” *Clio Rev. Hist. Ciencias Humanas Y Pensam. Crit.*, vol. 2025, no. 11, p. Article 2025(11), Dec. 2025, doi: 10.5281/zenodo.16424286.
- [14] L. A. De Sousa, A. L. C. Silva, M. D. R. M. Lopes, L. S. Ferreira, and M. D. B. Lima, “EDUCATIONAL ASSESSMENT USING DIGITAL TECHNOLOGIES: THE STATE OF THE ISSUE | AVALIAÇÃO EDUCACIONAL COM USO DE TECNOLOGIAS DIGITAIS: O ESTADO DA QUESTÃO,” *Conex. Cienc. E Tecnol.*, vol. 20, p. Article e026001, 2026, doi: 10.21439/conexoes.v20.4053.
- [15] V. Sevillano-Monje, Á. Martín-Gutiérrez, and M. León-Sánchez, “Comparative Analysis of Intercultural Education from the Perspective of Management Teams. The Case of Spain and France | Usporedna analiza međukulturnoga obrazovanja iz perspektive upravljačkih timova. Slučaj Španjolske i Francuske,” *Croat. J. Educ.*, vol. 25, no. 2, p. Article 25(2), 2023, doi: 10.15516/cje.v25i2.4944.
- [16] L. R. C. Lacerda and A. B. Vieira, “FORMAÇÃO CONTINUADA A PARTIR DA ESCOLA: articulação entre libras, língua portuguesa e currículo na educação de surdos,” *Curriculo Sem Front.*, vol. 24, p. Article e1884, 2024, doi: 10.35786/1645-1384.v24.1884.
- [17] K. Mastrothanas, A. Gkontelos, M. Kladaki, and E. Papouli, “Examining Puppetry’s Contribution to the Learning, Social and Therapeutic Support of Students with Complex Educational and Psychosocial Needs in Special School Settings: A Phenomenological Study,” *Disabilities*, vol. 5, no. 3, p. Article 67, Sep. 2025, doi: 10.3390/disabilities5030067.
- [18] S. V. Mbona, D. Muchakubvura, L. Zunga, and S. K. Msosa, “Teachers’ preparedness, attitudes, and perceived impact of technology use in lesson delivery in selected Zimbabwean schools,” *Educ. Inf. Technol.*, p. Article undefined, 2026, doi: 10.1007/s10639-026-13982-6.
- [19] UNESCO, “Alfabetización Mediática e Informacional,” UNESCO, 2025. <https://www.unesco.org/es/media-information-literacy>
- [20] D. Vergara, Á. Antón-Sancho, and P. Fernández-Arias, “Engineering professors’ habits: didactic use of Information and Communication Technologies (ICT),” *Educ. Inf. Technol.*, vol. 29, no. 6, p. Article 29(6), Apr. 2024, doi: 10.1007/s10639-023-12110-y.
- [21] M. Ferreira, “Teachers’ continuous training and inclusive education – A critical stance supported by teachers’ narratives,” *Educ. Self Dev.*, vol. 20, no. 2, p. Article 20(2), Jun. 2025, doi: 10.26907/esd.20.2.02.
- [22] T. Celestino, E. Ribeiro, E. G. Morgado, L. Leonido, and A. Pereira, “Physical Education Teachers’ Representations of Their Training to Promote the Inclusion of Students with Disabilities,” *Educ. Sci.*, vol. 14, no. 1, p. Article 49, Jan. 2024, doi: 10.3390/educsci14010049.
- [23] B. El Batri *et al.*, “Teaching Environmental Themes within the ‘Scientific Awakening’ Course in Moroccan Primary School: Approaches, Methods and Difficulties,” *Educ. Sci.*, vol. 12, no. 11, p. Article 837, Nov. 2022, doi: 10.3390/educsci12110837.
- [24] J. Hernández-Ramos, J. Rodríguez-Becerra, L. Cáceres-Jensen, and M. Aksela, “Constructing a Novel E-Learning Course, Educational Computational Chemistry through Instructional Design Approach in the TPASK Framework,” *Educ. Sci.*, vol. 13, no. 7, p. Article 648, Jul. 2023, doi: 10.3390/educsci13070648.
- [25] J. Piedade and E. Batista, “Teachers’ Perceptions of Augmented Reality in Education: Between Pedagogical Potential and Technological Readiness,” *Educ. Sci.*, vol. 15, no. 8, p. Article 1076, Aug. 2025, doi: 10.3390/educsci15081076.
- [26] J. B. Rojas-Espinoza, B. E. Martinez-Talavera, L. Cárdenas-Becerril, L. I. B. Jaramillo, B. A. Gómez, and S. S.

- Kempher, "Action research in pedagogical practices of teaching caring: Teaching experience | Investigación-acción en las prácticas pedagógicas sobre la enseñanza del cuidado: Experiencia docente," *Enferm. Glob.*, vol. 21, no. 1, p. Article 21(1), Jan. 2022, doi: 10.6018/EGLOBAL.480671.
- [27] C. Miranda-Jaña *et al.*, "Social and emotional learning of the Heads of Technical-Pedagogical Units participating in a continuous training program in Chile | Aprendizaje social y emocional que poseen los Jefes de Unidades Técnico-Pedagógicas que participan de un programa de forma...", *Estud. Pedagog.*, vol. 51, no. 3, p. Article 51(3), Dec. 2025, doi: 10.4067/S0718-07052025000300391.
- [28] L. Gumaelius, I. B. Skogh, Á. Matthíasdóttir, and P. Pantzos, "Engineering education in change. A case study on the impact of digital transformation on content and teaching methods in different engineering disciplines," *Eur. J. Eng. Educ.*, vol. 49, no. 1, p. Article 49(1), 2024, doi: 10.1080/03043797.2023.2285794.
- [29] C. R. Ponce de Leon Castillo, "Development of Digital Competencies in Teachers and the Implementation of Virtual Classes in Arequipa | Desarrollo de Competencias Digitales Docentes y la Implementación de Clases Virtuales en Arequipa," *Eur. Public Soc. Innov. Rev.*, vol. 9, p. Article 9, Jun. 2024, doi: 10.31637/epsir-2024-1655.
- [30] O. Belletich Ruiz and A. G. Onoiu, "Teaching training in Early Childhood education. Pedagogical Keys | Formación del profesorado de educación infantil en DUA. Claves pedagógicas," *Eur. Public Soc. Innov. Rev.*, vol. 9, p. Article 9, Jun. 2024, doi: 10.31637/epsir-2024-888.
- [31] K. Paredes Mena, J. Salazar Menéndez, and L. Simancas Ordóñez, "Teacher model: Professionalization and improvement of pedagogical and technological performance | Modelo del docente: Profesionalización y mejora del desempeño pedagógico y tecnológico," *Eur. Public Soc. Innov. Rev.*, vol. 9, p. Article 9, Jun. 2024, doi: 10.31637/epsir-2024-1845.
- [32] F. J. M. Terrón, M. C. Baz, A. M. Sánchez-Sánchez, and M. G. Martín, "Scientific literature on the training of university teachers in Spain: thematic analysis | Literatura científica sobre la formación del profesorado universitario en España: análisis temático," *Eur. Public Soc. Innov. Rev.*, vol. 10, p. Article 10, Jan. 2025, doi: 10.31637/epsir-2025-1182.
- [33] M. Abid, M. Bouali, B. El Andaloussi, and S. Messaoud, "The perceptions of Moroccan trainee teachers regarding the gender approach and its implementation in the classroom," *Front. Educ.*, vol. 10, p. Article 1550413, 2025, doi: 10.3389/educ.2025.1550413.
- [34] S. Pino *et al.*, "Use and meaning teachers assign to the integration of the MICA 3.0 kit for teaching climate change," *Front. Educ.*, vol. 10, p. Article 1537960, 2025, doi: 10.3389/educ.2025.1537960.
- [35] A. Basantes-Andrade, M. Cabezas-González, S. Casillas-Martín, M. Naranjo-Toro, and A. Benavides-Piedra, "NANO-MOOCs to train university professors in digital competences," *Heliyon*, vol. 8, no. 6, p. Article e09456, Jun. 2022, doi: 10.1016/j.heliyon.2022.e09456.
- [36] S. Tobon and E. F. Lozano-Salmerán, "Socioformative pedagogical practices and academic performance in students: Mediation of socioemotional skills," *Heliyon*, vol. 10, no. 15, p. Article e34898, Aug. 2024, doi: 10.1016/j.heliyon.2024.e34898.
- [37] G. C. S. Baptista, D. G. e. Silva, and J. A. da Silva, "Imagination, Thought, and Reflection on the Development of Teacher's Identity to Deal with Cultural Diversity," *Hum. Arenas*, vol. 8, no. 1, p. Article 8(1), Mar. 2025, doi: 10.1007/s42087-022-00318-2.
- [38] E. V. Burdina and S. V. Alexandrov, "Modern Trends in Further Professional Education of Judges: Russian and Foreign Experience | Современные тренды дополнительного профессионального образования судей: российский и зарубежный опыт," *Integr. Educ.*, vol. 26, no. 4, p. Article 26(4), 2022, doi: 10.15507/1991-9468.109.026.202204.771-786.
- [39] P. da S. Gonçalves and L. S. F. Do Nascimento, "Physical education in an environmental disaster setting: lessons from the May 2024 floods in Rio Grande do Sul, RS, Brazil | Educação Física em cenários de desastres ambientais: lições a partir da enchente de maio de 2024 no Rio Grande do Sul, RS, Brasil," *Interface Commun. Heal. Educ.*, vol. 29, p. Article

e240665, 2025, doi: 10.1590/interface.240665.

- [40] A. Tahiri, A. Chikhaoui, J. Assermouh, M. Halim, and S. Benfares, "Contribution of Online Tutoring in Promoting the Quality of Distance Learning for Moroccan Teachers," *Int. J. Eng. Pedagog.*, vol. 13, no. 5, p. Article 13(5), 2023, doi: 10.3991/ijep.v13i5.34047.
- [41] A. Zahra, T. Soumia, and R. Mohamed, "The impact of continuous teacher training based on the flipped classroom on teaching practices and learner performance," *Int. J. Eval. Res. Educ.*, vol. 14, no. 1, p. Article 14(1), Feb. 2025, doi: 10.11591/ijere.v14i1.29989.
- [42] Hasbiyallah, M. Munadi, and D. Nurulhaq, "Character Education Model for High School Students during the Pandemic in terms of Pedagogic Competence and Teacher Personality," *Int. J. Instr.*, vol. 16, no. 2, p. Article 16(2), Apr. 2023, doi: 10.29333/iji.2023.16257a.
- [43] V. N. T. Nguyen, H. P. T. Tran, N. A. Doan, and V. A. T. Dao, "Using the Delphi Method to Explore Factors Affecting the Effectiveness of Pedagogical Competence Training on University Lecturers in Vietnam," *Int. J. Learn. Teach. Educ. Res.*, vol. 22, no. 12, p. Article 22(12), Dec. 2023, doi: 10.26803/ijlter.22.12.3.
- [44] A. P. Crisologo *et al.*, "Teaching Beliefs and Efficacy of Preservice English Teachers on Differentiated Instruction Practice in Multilingual Classrooms," *Int. J. Pedagog. Curric.*, vol. 30, no. 2, p. Article 30(2), 2023, doi: 10.18848/2327-7963/CGP/v30i02/1-22.
- [45] L. Raimi, "First-mover advantage in AI adoption in higher education: a critical discourse analysis of social policy, inequality, and institutional governance," *Int. J. Sociol. Soc. Policy*, p. Article undefined, Jun. 2026, doi: 10.1108/IJSSP-01-2026-0057.
- [46] N. Jad, K. Raouf, K. Elkababi, and M. Radid, "TEACHING PRACTICES OF SCIENTIFIC AWAKENING RELATED TO MANAGEMENT OF REPRESENTATIONS OF PRIMARY SCHOOL LEARNERS: INSPECTORS VIEWPOINTS," *Int. J. Tech. Phys. Probl. Eng.*, vol. 14, no. 1, p. Article 14(1), Mar. 2022.
- [47] M. Y. Law, "Leadership and change management in the transition to online curriculum delivery in Malaysia: a comparative case study," *J. Appl. Res. High. Educ.*, vol. 16, no. 4, p. Article 16(4), Jul. 2024, doi: 10.1108/JARHE-02-2023-0054.
- [48] S. M. M. Lopes, T. M. L. Roberto, L. O. M. Lopes, M. da Silva, Z. A. S. G. Soler, and J. C. André, "Coordination between Regulatory Organs and Schools in Special Education: The Figure of the Teacher Specialized in Curriculum," *J. Educ. Train. Stud.*, vol. 14, no. 1, p. Article 14(1), Jan. 2026, doi: 10.11114/jets.v14i1.7900.
- [49] O. Arranz-García, M. del C. R. García, and V. Alonso-Secades, "PERCEPTIONS, STRATEGIES, AND CHALLENGES OF TEACHERS IN THE INTEGRATION OF ARTIFICIAL INTELLIGENCE IN PRIMARY EDUCATION: A SYSTEMATIC REVIEW," *J. Inf. Technol. Educ. Res.*, vol. 24, p. Article 6, 2025, doi: 10.28945/5458.
- [50] N. Nesterchuk, S. Rabcheniuk, A. Kuriata, H. Boreiko, and D. Skalski, "Application of fitness technologies to increase motor activity and physical fitness of adolescents," *J. Phys. Educ. Sport*, vol. 21, p. Article 389, Oct. 2021, doi: 10.7752/jpes.2021.s5389.
- [51] J. Uribe, "Determinants of The Quality of Ongoing Professional Training in an Online Format from The User's Perception: An Empirical Study in Chile," *J. Tech. Educ. Train.*, vol. 17, no. 3, p. Article 17(3), Oct. 2025, doi: 10.30880/jtet.2025.17.03.015.
- [52] F. Maujud and Syaharuddin, "A QUALITY ASSURANCE FRAMEWORK FOR STRENGTHENING POST-CERTIFICATION ARABIC LANGUAGE TEACHER PERFORMANCE IN MADRASAH," *J. Pendidik. Islam*, vol. 11, no. 2, p. Article 11(2), Sep. 2025, doi: 10.15575/jpi.v11i2.49517.
- [53] H. I., L. S., and B. A., "Impact of hybrid education mechanisms on university professor's self-efficacy: Case of Moroccan universities," *Knowl. Manag. E Learn.*, vol. 17, no. 4, p. Article 17(4), 2025.
- [54] A. W. C. Falcón, J. F. Gómez Reategui, K. J. Celi-Arévalo, and L. E. Graus Cortez, "Integrating artificial intelligence in higher education: a systematic and bibliometric study | Integración de la inteligencia artificial en la educación

superior: estudio sistemático y bibliométrico,” *Prism. Soc.*, vol. 2026, no. 52, p. Article 2026(52), Jan. 2026, doi: 10.65598/rps.5992.

- [55] S. N. Vachkova, E. Y. Petryaeva, I. M. Remorenko, and Y. I. Sumenkova, “A study of composition of teaching personnel working in pre-professional classes in Moscow’s schools | Особенности кадрового состава педагогических работников предпрофессиональных классов школ,” *Perspekt. Nauk. I Obraz.*, vol. 70, no. 4, p. Article 70(4), Jul. 2024, doi: 10.32744/pse.2024.4.43.