

Authentic assessment strategies in virtual and face-to-face higher education contexts. Experience for pre-service teacher education

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Abstract

Introduction: Research on assessment of learning in Higher Education has had a significant development seeking to modify its transmissive logic and incorporate current knowledge on training and learning of professional skills. **Purpose:** Analyze, implement, and suggest authentic assessment strategies at different levels of a pre-service teacher education program for their use in face-to-face and virtual contexts. **Method:** Action research that takes place in a Chilean Jesuit university where authentic assessment is promoted in its pedagogical model. The study has two stages: Diagnosis - questionnaire (N=102) and discussion group are applied to university students - Application of innovative assessment strategies developed by university teachers between the first and fourth years of the program. **Results:** Students and teachers suggest improvements in instructions and assessment criteria and in feedback and participation. Based on this, an innovative assessment strategy is implemented in five key courses of the study plan. **Discussion:** Five key orientations are described to develop authentic assessment strategies in university contexts and contribute to compliance with quality standards and criteria in higher education: contextualization; complex skills assessment; anticipate expected performances; promote evaluative judgment in the students themselves and plan forms of feedback.

Keywords: Assessment; Higher Education; Pre-service Teacher Education; Action Research

Estrategias de evaluación auténtica en contextos virtuales y presenciales de educación superior. Una experiencia en formación inicial docente

Resumen

Introducción: La investigación sobre evaluación de aprendizajes en educación superior ha tenido un significativo desarrollo buscando modificar sus lógicas transmisivas, e incorporar conocimiento actual sobre formación y aprendizaje de competencias profesionales. **Objetivo:** Analizar, implementar y proponer estrategias de evaluación auténtica en distintos niveles de un programa de formación docente para su uso en contextos presenciales y virtuales. **Método:** Investigación acción

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que se desarrolla en una universidad jesuita chilena donde se impulsa la evaluación auténtica en su modelo pedagógico. El estudio tiene dos etapas: Diagnóstico -se aplica cuestionario (N=102) y grupo de discusión a estudiantes universitarios - Aplicación de estrategias evaluativas innovadoras desarrolladas por docentes universitarios entre el primer y cuarto año del programa. **Resultados:** Estudiantes y docentes sugieren mejoras en las instrucciones y criterios de corrección y a la retroalimentación y participación. En base a esto se implementa una estrategia innovada de evaluación en cinco cursos claves del plan de estudio. **Discusión:** Se describen cinco orientaciones claves para desarrollar estrategias de evaluación auténtica en contextos universitarios y aportar al cumplimiento de estándares y criterios de calidad en educación superior: contextualización; evaluación de habilidades complejas; anticipar desempeños esperados; favorecer el juicio evaluativo en los propios estudiantes y planificar las formas de retroalimentación.

Palabras clave: Evaluación; Educación Superior; Formación Inicial de docentes; Investigación Acción.

Introduction

The assessment of learning in higher education has had a significant development in a context where training processes seek to modify their transmissive logics and incorporate what we currently know about adult learning and the development of professional competencies. Moreover, assessment has been described as a lever that can mobilize improvement and innovation in university teaching strategies, becoming a relevant area for research and innovation.

In fact, the literature points out profusely that assessment practice largely determines teaching practice, as it conditions content, strategies, motivations, and learning (Barberà, 2003; Biggs, 2004; Bonsón & Benito, 2005; Dochy et al., 2002; Santos, 1999; Zabalza, 2003; Jorba & Sanmartí, 2008). In this sense, some authors point out that assessment conditions learning, even much more than teaching, becoming a significant guide for learning, since, in the act of assessing, teachers send a powerful message to their students about what they should learn and how (McDonald et al., 2013). However, several studies show that, in higher education, habitual or traditional forms of assessment persist that fail to account that fail to account for the competencies stated in the professional training curricula or to show how students are learning (Villarroel & Bruna, 2019).

This context points to the need to shift assessment practices from a culture focused on grading towards processes more clearly oriented to student learning.

When analyzing assessment practices in training, it is said that the current challenge of higher education teaching is to move from a culture of examination to a culture of assessment that implies a formative understanding that is oriented to student learning and their greater involvement in the assessment processes (Dochy et al., 2002; Cañadas, 2020). An alternative is to do so by moving away from an *assessment of learning* towards an *assessment for learning* (Bonsón & Benito, 2005). In turn, this means that whatever curricular innovation is sought, it will also require reviewing and transforming the assessment conceptions and practices put into action (Dochy et al., 2002).

In this context, the literature refers to *assessment for learning* and *authentic assessment* in higher education as key concepts to address this shift towards a university pedagogy that can enhance student learning and strengthen the development and certification of relevant professional competencies for job performance.

A recent review of these concepts points out that the main characteristics of *learning-oriented* assessment are: a) assessment tasks should stimulate students' learning; b) assessment should involve students in their own and their peers' assessment; and c) feedback should be timely and useful for the student's current and future learning. For their part, the authors refer to *authentic assessment* as a more specific modality, with strong formative potential where much

more realistic, context-specific assessment tasks are used in which students must demonstrate their learning by solving problems that are similar to those that may arise in the exercise of the profession and using contexts close to or equivalent to those they will encounter in the labor market (Barrientos-Hernán et al., 2020).

Currently, there is a growing line of work that shows the relevance of *authentic assessment* processes in higher education as an assessment methodology for learning (Barrientos-Hernán et al., 2020; Villarroel et al., 2017; Villarroel & Bruna, 2019). Indeed, research in the field of assessment in university classrooms reports criteria and experiences to move towards strategies and instruments in which the contextualization of assessment items or tasks is more relevant. Likewise, they are expected to promote higher order cognitive skills and are also linked to the skills stated in the graduate profiles for better articulation with the tasks of the profession in which the students are being trained (Buscà et al., 2010; Villarroel et al., 2015).

Additionally, the pandemic brought about additional concerns for assessment in virtual teaching and learning contexts (Fardoun et al., 2020; Cabero-Almenara & Palacios-Rodríguez, 2021). When evaluating, university professors have expressed greater concerns and uncertainties, especially about summative assessment strategies (Cisternas, et al. 2022). Hence, the challenge of advancing in the systematization and improvement of strategies based on an assessment for learning approach is relevant.

Facing this this background, the research problem is contextualized in a higher education institution with guidelines for university teaching based on an assessment for learning approach. This translates into various orientations for undergraduate training programs and their professors to develop “complex, meaningful, and integrative” assessment and to establish known and shared assessment criteria. Indeed, integrative assessment situations must be (i) complex, given the type of information they provide and the tasks or problems to be solved, which must be global and demanding; (ii) meaningful, since they must be oriented to the completion of tasks that engage

the student at the personal level; and (iii) integrate and mobilize different types of knowledge at the same time (Universidad Alberto Hurtado, 2019, p. 84). In this scenario, the teams this research have developed an experience that requires moving towards greater institutionalization and effectiveness. The review and innovation in the assessment practices, considering the dimensions and characteristics of *authentic assessment*, would allow responding to the formative needs and ensuring the educational path of students and the achievement of relevant professional competencies. Therefore, it is pertinent to carry out a study with an action research approach, contributing with proposals to develop relevant *authentic assessment* strategies, both in virtual and face-to-face contexts.

The objective of this research study, therefore, was to analyze and implement *authentic assessment* strategies at different levels of an initial teacher education program (ITE) for virtual and face-to-face contexts. In this paper, we report the following associated purposes: a) to identify the challenges and strengths of the assessment strategies implemented in virtual and face-to-face contexts from the students' point of view, and b) to determine criteria and put into action *authentic assessment* strategies in line with the challenges detected and the current perspectives on assessment in higher education.

Method

Design

The design of this innovation was guided by the principles and strategies of the action research approach (Latorre, 2003), which offers a logical framework consistent with the purpose of developing a research proposal in higher education under solid foundations and a collaborative process with the intention of improving a given practice. Thus, the action research (AR) design is framed by the following features: i) it is participatory, because people work to improve their own practices; ii) it is collaborative, because it is done collectively

with shared purpose; iii) it tests and contributes to theorizing about practice; iv) it involves recording and analyzing, incorporating critical analysis; and v) it shifts towards broader changes or changes that serve other contexts ([Kemmis & McTaggart, 1988](#)). The study nomah quantitative and qualitative techniques for data collection and analysis to establish a starting point (diagnosis) to then determine a proposal for action based on the findings, analyzing achievements, recommendations, conditions, and scope of the innovation developed in context.

Procedure

The research consisted of two stages. In the first stage, a diagnosis was made of the strengths and weaknesses in the assessment processes and strategies from the students' perspective in order to have inputs for the innovation in assessment practices that adjusts to the achievements and challenges identified. To this end, two strategies were used: the design of a questionnaire and a discussion group, both aimed at university students in the program. The second stage consisted of the design and implementation of summative assessment strategies, from an authentic assessment approach, in four cohorts of students in the program at the end of the academic semester, which is when the assessment and grading processes intensify. After analyzing and reflecting on the strategies developed, criteria and practical guidelines consistent with the specialized literature were developed to serve as a support tool for university teaching in this and other higher education programs.

The process complied with the ethical considerations inherent to research with individuals. Authorizations and informed consents were used with students and professors in all data collection processes (questionnaire, focus group, participation in the innovation), and the anonymity and confidentiality of the data were safeguarded in the process of analysis and reporting of results.

Context and Participants

The study was carried out at a Jesuit university in the city of Santiago, Chile, which offers professional

training and research in the humanities and social sciences, including teacher education for the kindergarten, elementary, and high school levels of the school system. As we pointed out in the initial background section of this research, the institution promotes a model of university pedagogy that gives prominence to authentic assessment and mobilizes innovation in this field. In this scenario, the study is carried out in a 10-semester initial teacher training program, which grants a bachelor's degree in education and professional training in special education pedagogy. Graduates work as teachers in elementary and high schools, providing specialized support to offer inclusive responses to the educational needs of students. It should be noted that the research team is part of this program.

The diagnostic stage was carried out through a non-probabilistic sample where 102 students from the second to fourth year cohorts participated, since this group has experience in carrying out formative and summative assessments in the program, making their perceptions and assessment relevant. The sample reached a response rate of 82%. Likewise, through a purposive sampling of key informants, eight students who belonged to different semesters of the study program and with different levels of academic performance participated ([Flick, 2004](#)). In the second stage of development of the innovation, the participants consisted of five university professors who met the following criteria: over three: over three years of experience in the program, willingness to innovate in their own assessment practices and develop a key course within the study plan in terms of credits and relevance for the achievement of the graduate profile.

Instruments and Analysis

A semi-structured questionnaire was constructed and validated with the purpose of identifying students' perceptions of the way in which they experience the assessment processes in the different subjects of the study plan, establishing strengths, weaknesses, expectations, and challenges of these processes in virtual and face-to-face contexts. The design of this instrument was validated by means of expert judgment with two specialists, one in university assessment and

Table 1

Dimensions	Type / No. of questions
D1: Characterization of the student	Close-ended / 2
D2: Characterization of the evaluation instruments	Close-ended / 8
D3: Experience before and during the graded evaluations	Close-ended / 4
D4: Results and feedback from evaluations	Close-ended / 5
D5: Emotional aspects involved in evaluation	Close-ended / 4
D6: Positive and negative elements of evaluation in a virtual context	Open-ended / 3

teaching and the other in higher education and teacher training. This was followed by a pilot test and subsequent interview with 4 students of the program. This process validated the dimensions and questions of the instrument, with high levels of consistency among experts and students, and made it possible to adjust the number of items and the language used in some items to ensure understanding. The final version of the instrument was composed of six dimensions with a total of 23 closed-ended questions (multiple choice and Likert) and three open-ended questions, as indicated below:

The instrument was applied in online format and was answered by 102 students of the program (82%). The data analysis was carried out using descriptive statistics to identify trends and variance in each question and to establish strengths and challenges by dimension. The open-ended questions were analyzed using the content analysis strategy, determining categories from the literature reviewed.

The second instrument used for the diagnosis

was a group discussion guideline with students, the purpose of which was to delve qualitatively into the strengths and challenges of the assessment processes from the questionnaire. This technique allows bringing together different perspectives and is defined as a carefully planned conversation to obtain information on a specific topic (Barbour, 2013). A priori categories based on the referential framework were used for the focus group analysis. The process culminated with the triangulation and validation of the set of analyses (Flick, 2004). In the second stage of this AR, focused on the design and development of innovation in assessment, we worked with the written record of the reflection and discussion processes, and the analysis of results was guided by questions and the analysis of evidence from implementation (assessment instruments designed and implemented with the students, feedback materials, among others). The results were validated in a collaborative and documented work process (Latorre, 2003).

Table 2 below summarizes the instruments and participants according to the AR stages.

Table 2

Summary of Data According to AR Moments

AR Stages	Instrument	Type of participants	Quantity
Diagnosis	Questionnaire	Students from second to fourth year of training	102
	Discussion group	Students from second to fourth year of training	8
Design and implementation	Written report of collective discussion and analysis of results Summative evaluation instruments with authentic assessment approach	Professors of subjects from first to fourth year of the program	5

Results

The findings are organized according to the stages of this AR. First, the main strengths and challenges perceived by the students of the program in their experience with assessment in face-to-face and virtual contexts are described. Then, we report on the design and implementation of strategies based on an authentic assessment approach in higher education, emphasizing the development of criteria and guidelines that are relevant to other higher education contexts.

a) Strengths and Challenges of Assessment Proposals

The results show that, for students, summative

assessment or written exams are aligned with the characteristics of authentic assessment (see Tables 3 and 4). Indeed, they perceive them as a tool that allows them to better demonstrate their learning (item 1) and to familiarize themselves with the challenges of the professional field (items 3, 4, and 5), also valuing feedback as a key component to enhance learning (6). In this regard, it should be reminded that the institutional context in which the study was being developed has a history and background of some assessment for learning practices prior to this innovation, which serves as a baseline for the improvements expected to be achieved. The following excerpts illustrate the assessment when faced with real situations and the application of technological resources in the context of virtual assessment:

Table 3
Results of Student Questionnaire

CHARACTERISTICS AUTHENTIC ASSESSMENT Virtua and face-to-face context	% Never/ Sometimes	% Almost always / Always
Assessments allow me to identify my strengths and weaknesses.	31.7	68.3
The proportion of group and individual evaluations is adequate to demonstrate my learning.	27.7	72.3
Evaluations are contextualized in real situations or cases.	20.8	79.2
I am required to relate theoretical concepts to practical situations.	2	98
They allow me to become familiar with the tasks of my profession.	10.9	89.1
They provide me with relevant information on how to improve and advance in the key learning areas of the subjects.	23.8	76.2
PRECONDITIONS FOR THE APPLICATION OF THE ASSESSMENT		
The guideline and its evaluation indicators are explained in an assignment.	0	100
The characteristics of the tests or examinations are reported.	24.8	75.2
I participate as a student in the definition of some evaluation criteria.	70.3	29.7
CONDITIONS FOR REPORTING ASSESSMENT RESULTS		
They include clear and understandable comments.	40.6	59.5
Aspects not achieved and/or to be improved are pointed.	38.6	61.4
Achievements and/or positive aspects are pointed.	39.6	60.4
The possibility of addressing doubts and eventually modifying the score is given.	47.5	52.4

...I feel that it is much more useful, not only for the assessment but also for us, to be presented with a situation in which we are going to be at some point, for example 'this child has such a difficulty, how would you approach it?' I think that this is very useful in terms of assessment because it does not only evaluate content but what we are going to do at some point, what we are going to have to apply, and shows us how it would be applied and what tools we should use for that situation. (Student discussion group)

I think that virtuality has allowed us to try out more forms of assessment. Of course, we were able to make videos, perhaps work on different platforms, and I believe that this also contributes to our growth as professionals and to broaden our knowledge in terms of types of assessment. (Students discussion group)

Regarding the challenges and improvement needs resulting from the questionnaire and focus group, the students identified heterogeneity in

the feedback practices by professors within the program (Table 4). The following quote illustrates this finding:

They give us written final exams and everything, then they give us back the rubric with the scores we got, but there's not much more detail about it. It is either "you passed" or "you didn't pass." There is no feedback, "look, you passed for such and such," or "you didn't pass for such and such; I suggest you do..." So, for those aspects, I feel that it is going to depend a lot on the professor. It's like it is not about the program itself, but about the professor and how they structure it. (Student focus group)

As shown in Table 4, in assessment situations in a virtual context, it is pointed out the need to improve the time assigned for tests and assignments, the variety of tasks or instruments used, and the clarity of the wording of questions and instructions. Along the same lines, it was suggested improving student participation in the design of assessment guidelines and indicators, as well as in the explanation or

Table 4
Results of the Student Questionnaire¹

FACE-TO-FACE AND DISTANCE CONTEXT	Improvement required (%)	No improvement required (%)
Clarity of the written instructions for the evaluation	45.5	46.5
Clarity of evaluation indicators or criteria	48.5	50.5
Student participation in the preparation of rubrics and/or its evaluation indicators	71.3	21.8
Explanation or exemplification of the evaluation criteria	58.4	35.6
DISTANCE OR VIRTUAL CONTEXT		
The variety of tasks or instruments used	59.4	35.6
Clarity of wording in questions and instructions	55.4	36.6
Evaluation criteria	36.6	56.4
The time assigned for tests	78.2	19.8
The feedback	74.3	22.8

¹The question was formulated with three alternatives: Yes, needs improvement / No improvement required / Do not know. Percentages of the first two are shown in the table.

exemplification of assessment criteria.

Regarding time, I also feel that it is a factor to improve... maybe they are a little more flexible when it comes to time because it can make you nervous, and then you do not manage to write everything you wanted to write. So, I feel that this is also a factor that needs to be improved. (Student discussion group)

In some courses, for example... we do not understand the instructions for a test or an assignment. Or sometimes one group understands one thing and another group understands something else. So, maybe, the instructions can be a little clearer. (Student discussion group)

b) Development of Innovation in Assessment Practices

Based on the results described in the previous point and the specialized literature, the research team, together with the participating professors, designed and applied summative assessment strategies from an authentic assessment approach in five subjects corresponding to different lines of training in first-, second-, third-, and fourth-year courses of the pedagogy program. Based on the principles of action research designs ([Latorre, 2003](#)), a collegiate work among university professors was proposed, including comments, suggestions, and the review of the designed assessment instruments before their application. In this way, each new assessment proposal was developed by the teaching team considering the following five components:

a) Assessment rubric and instructions that inform students of the expected learning outcomes and characteristics of the assessment; b) use of real situations or cases, decision making in actions, intervention plans; c) incorporation of the descriptors of the graduate profile to which the assessment contributes; d) planned session for feedback on results directed to the students, incorporating aspects achieved and to reinforce; e) additional session for student self-assessment.

Based on these elements, five summative and integrative assessment instruments were designed and applied at the end of the semester,

which used one or two forms, and where different types of items were formulated: open-ended questions based on cases or problem situations. These were applied to the students in a virtual format, in a synchronous manner, with the support of a technological platform.

The analysis of the experience reveals interesting findings. In the first place, the incorporation of self assessment items led to a greater flexibility and responsibility on the part of students in their learning. On the other hand, by incorporating in the assessment instrument the competencies stated in the graduate profile, a greater articulation with the specific learning goals of each course of the study plan is achieved, making the course within the formative path meaningful. Also, the incorporation of the assessment criteria and scores in the same instrument makes the process of grading and determining outcome attainment more efficient and coherent. As a result, the instruments provide more and better evidence of the learning outcomes that were attained or not and help students to know what was expected of them. As for the virtual assessment, it was key to clearly inform students what was expected of them and how they had to demonstrate it through the assessment rubric and the explicitness of the graduate profile indicators.

Under this modality, instruments with more than one form were generated to reduce the risk of plagiarism among students. The problem situations or cases are a good strategy, since they provide greater authenticity with respect to what is expected to be measured—responding to this type of item requires greater elaboration and not a standard response or a simple evocation.

To provide feedback to students, criteria were defined at two levels. At the individual level, the strategy of incorporating written comments and elaborating explanatory audios was used through the Teams digital platform. At the group level feedback on the most important common strengths and weaknesses was provided through virtual sessions or video or voice recordings.

The results reveal the importance of diversifying the forms of feedback on the summative assessment results in virtual contexts, combining individual and group formats.

Discussion and Conclusions

This section describes five key orientations for developing authentic assessment strategies in university contexts² using as input the results of this research, which are more closely linked to the antecedents reported in the specialized literature.

In the first place, it is important to ensure *contextualization*, that is, to organize the assessment based on authentic situations or real cases that allow students to become familiar with elements of their future work context. The assessment should use real situations with problems similar to the tasks they will encounter in their professional life. This allows learners to make sense of and value knowledge as a tool that will allow them to solve professional situations, while, at the same time, requiring the application of knowledge through complex skills or abilities (Villarroel & Bruna, 2019; Barrientos-Hernández et al., 2020).

Second, it is important to prioritize the *assessment of complex skills* related to the competencies of the graduate profile and the learning objectives of the subject. Complex thinking skills are fundamental for students to transform knowledge in real contexts. Research (Villarroel et al., 2017, 2018; Villarroel & Bruna, 2019) shows that thinking skills derive from work related contexts and from skills within the discipline that are stated in the graduate profile. It involves posing situations that require analyzing information, synthesizing findings, applying concepts in a contextualized manner, reflecting critically on what they have learned, making and communicating decisions, and innovating and creating new solutions.

The third orientation is the importance of describing and *informing students of the characteristics of the assessment and the expected performance*. The assessment criteria should guide them in the preparation of the assessment and clarify what is expected of them.

As stated by Vallejo Ruiz & Molina Saorín (2014), during the application of authentic assessments, it is essential to consider support for students to understand the existing expectations in terms of the level of achievement expected. It should also be considered that the university professor can clearly communicate the performance expectations in terms of criteria agreed with the group. Such criteria will be used to judge their performance, while at the same time generating the necessary conditions and mechanisms that allow recording the students' progress. Along the same lines, Hernández et al. (2021), when referring to feedback processes, recognize the importance for student perception of specifying clearly and early the tasks and/or learning outcomes expected of them.

The fourth element to be considered is the importance of *favoring the development of assessment judgment in the students themselves*, democratizing decision making by allowing student participation in the construction of assessment criteria and fostering self assessment and peer assessment processes. Specifically, to favor the development of assessment judgment, Villarroel and Bruna (2019) suggest involving students in the construction of the criteria and in the assessment processes themselves. This implies diversifying the ways in which assessment is conducted, incorporating other procedures and techniques, ensuring the participation of different agents: student self-assessment, peer assessment, professor assessment.

The fifth orientation that emerges from this action research refers to the *planning of feedback* on results to students to ensure that it provides them with useful information to understand their strengths and weaknesses and know how to improve their performance. Feedback is a way of developing assessment judgment, i.e., it promotes competencies that allow them to evaluate their own performance and that of others. In this sense, Villarroel et al. (2015) state that feedback must contemplate at least three criteria: a) clarity regarding what good performance entails for the task being required; b) understanding of the gap between current and expected performance; and

²The project developed two audiovisual capsules to socialize these orientations among university professors: 1) <https://www.youtube.com/watch?v=HeBiM9NMeKE> y 2) https://www.youtube.com/watch?v=x_dUaaAgP8U

c) clear understanding of what needs to be done to address the gap between their current and expected performance.

Regarding the requirements for virtual assessments, this research identified two essential aspects to address the assessment of professional competencies under this modality. On the one hand, it is necessary to maintain an assessment design with tasks whose complexity allows competencies and not only declarative knowledge to be put into play. On the other hand, rubrics or qualitative descriptions should be used, where assessment criteria focused on the learning outcomes or competencies expected to be evaluated are presented (Zapata, 2015; Cubero-Ibáñez et al. 2018).

Moreover, Lezcano & Vilanova (2017) point out that feedback processes need to be reviewed in virtual contexts as they change the forms of communication between professor and students. In their research, they recommend the use of tools such as forums, online comments, shared documents, messaging, and chat. Along these lines, Hernández et al. (2021) identify that students have a positive view of feedback and its influence on learning improvement and self-regulation processes when it is clear, focused on the task, and when the possibilities offered by virtual environments are used to facilitate an interactive dialogue among peers. Furthermore, this study, in agreement with that of Rodríguez Conde (2005), recognizes that the use of virtual learning strategies depends on and is subordinated to the type of learning to be evaluated and how we want to use the assessment.

The findings of this research are considered valid in relation to the nature of the study, given that it had qualitative emphasis, was contextualized, and sought to improve the practice of the participants through an action research design.

One limitation of the study is that it was not possible to obtain the students' perception of the strategies implemented, something to be addressed in future research. Another element is the number of participating professors; broadening the sample will enrich the experience. Nevertheless, the results of the study

were validated by the academic body of the program, including those who innovated in their proposals. In addition, the theoretical review of the defined principles allows for consistency in the results.

In conclusion, the study allowed addressing a significant challenge for university teaching: articulating different types of learning (conceptual, procedural, attitudinal) with teaching strategies, assessment methods, and student achievement. Indeed, this type of research in higher education has significant implications in the formative paths, an issue that has gradually gained relevance considering the heterogeneity of the student body and the learning support requirements observed in our university classrooms. Improving quality and equity in higher education in general, and initial teacher training in particular, requires considering assessment instruments that respond to different levels of achievement and assessment situations that enhance autonomy, commitment, motivation, and the capacity for self-regulation in future professionals, which, in turn, contributes to the fulfillment of quality standards and criteria for university training.

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