



Design and validation: CODES questionnaire on the teaching in higher education

Diseño y validación: Cuestionario CODES sobre oficio docente en la universidad

- Juan Pablo Lovey** is a PHD student at IRICE-CONICET/UNR (Argentina) (<https://ror.org/03cqe8w59>) (lovey@irice-conicet.gov.ar) (<https://orcid.org/0000-0003-1358-7667>)
- Dr. María Paula Pierella** is a researcher at IRICE-CONICET/UNR (Argentina) (<https://ror.org/03cqe8w59>) (pierella@irice-conicet.gov.ar) (<https://orcid.org/0000-0002-6679-9869>)
- Dr. Ana Borgobello** is a researcher at IRICE-CONICET/UNR (Argentina) (<https://ror.org/03cqe8w59>) (borgobello@irice-conicet.gov.ar) (<https://orcid.org/0000-0002-2340-8127>)

Received on: 25/02/2026 / **Revised on:** 18/06/2026 / **Accepted on:** 19/06/2026 / **Published on:** 1/07/2026

Abstract

This study is part of a broader research project on university admission, retention, and virtualization in public universities. Its aim is to present the design and preliminary validation of the Questionnaire on the Teaching Profession in Higher Education (CODES), an instrument that operationalizes the teaching profession through three dimensions: pedagogical practices, organizational setting, and the use of digital technologies. CODES was developed as an online questionnaire using five-point Likert-type response scales and is currently in a preliminary stage of psychometric development. Content validity was assessed through expert judgment involving 15 specialists, and Aiken's V coefficient was calculated for each item, yielding values ranging from 0.96 to 1.00. The pilot study included the voluntary participation of 66 faculty members from 11 academic units at a public university in central Argentina. High levels of internal consistency were obtained, with a Cronbach's alpha of 0.87 and a McDonald's omega of 0.91 for the overall construct. The proposed dimensional structure was supported by a preliminary exploratory factor analysis (EFA), although confirmatory factor analyses have not yet been conducted. CODES constitutes a contextualized and relevant instrument for studying the teaching profession and is sensitive to transformations in teaching practices. Its preliminary psychometric properties support its use in future research and guide subsequent validation stages, including confirmatory factor analyses with larger samples.

Keywords: university teaching, questionnaire, higher education, Educational sciences, labor conditions, digital teaching skills.

Resumen

Este trabajo forma parte de una investigación más amplia sobre ingreso, permanencia y virtualización en la universidad pública. El objetivo es presentar el diseño y la validación preliminar del Cuestionario sobre Oficio Docente en Educación Superior (CODES), instrumento que operacionaliza el oficio docente en tres dimensiones: prácticas pedagógicas, ámbito organizacional y usos de tecnologías digitales. El CODES se elaboró como cuestionario en línea, con escalas Likert de cinco opciones de respuesta y se encuentra en etapa preliminar de desarrollo psicométrico. La validez de contenido se evaluó mediante juicio de 15 especialistas y se calculó el coeficiente V de Aiken por ítem, con valores entre 0,96 y 1,00. La prueba piloto contó con la participación voluntaria de 66 docentes de 11 unidades académicas de una universidad pública del centro de Argentina. Se obtuvieron valores elevados de consistencia interna, con un Alfa de Cronbach de 0,87 y un Omega de McDonald de 0,91 del constructo general. La estructura dimensional propuesta fue confirmada por análisis factorial exploratorio (AFE) preliminar, sin contar con análisis factoriales confirmatorios. El CODES constituye un instrumento contextualizado y pertinente para el estudio del oficio docente, sensible a las transformaciones en las prácticas en docencia. Sus propiedades psicométricas preliminares sustentan su aplicación en investigaciones futuras y orientan etapas posteriores de validación, entre ellas los análisis factoriales confirmatorios con muestras más amplias.

Palabras clave: docencia universitaria, cuestionario, educación superior, ciencias de la educación, condiciones de trabajo, competencias digitales docentes.

Suggested citation (APA): Lovey, J. P., Pierella, M. P. and Borgobello, A. (2026). Design and validation: CODES questionnaire on the teaching in higher education. *Alteridad*, 21(2), 225-237. <https://doi.org/10.17163/alt.v21n2.2026.05>

1. Introduction

As part of a research project aimed at analyzing issues related to admission, retention, and virtualization in higher education, this study presents the design and content validation of the Questionnaire on Teaching Practice in Higher Education (*Cuestionario sobre la Práctica Docente en la Educación Superior*, CODES). This project is being conducted at a public university in central Argentina that has undergone a rapid process of virtualization—a shift that has intensified significantly since the onset of the COVID-19 pandemic. Within this context, the development of psychometric and educational instruments was examined, resulting in the definition of three theoretical dimensions to structure the CODES: pedagogical practices, the organizational environment, and the use of digital technologies.

The importance of developing specific instruments to study university instruction is closely linked to the pivotal role of faculty in institutional engagement and student academic trajectories, particularly during the first years of study (Coulon, 2019). Faculty teams are key actors in driving institutional improvements related to enrollment, retention, and graduation (Johnston, 2013; Santos Sharpe, 2020; Silva Laya, 2011; Sotelo, 2025). Given that university dropout rates are associated with multiple systemic factors (Tinto, 1993; Silva Laya, 2015; Vercellino, 2021), it is critical to advance research that examines the pedagogical and working conditions of teaching, while accounting for the structural transformations of higher education systems. Such research provides essential empirical evidence to inform policies aimed at democratizing access and retention in higher education (Pierella et al., 2020; Juarros et al., 2016).

The teaching profession has been conceptualized through several complementary theoretical lenses. Alliaud (2014) emphasized that educational quality is the product of the collective responsibility of the teaching profession. Dubet (2006) defined teaching as a complex process of subjectivation and socialization shaped by diverse and often competing demands. Meanwhile, Alliaud and Antelo (2009) highlighted its historical and professional nature, emphasizing the situated construction of knowledge rooted in practical experience. University teaching involves a dynamic relationship among faculty expertise, disciplinary content, and students, requiring a

deliberate and conscious stance regarding learning objectives and pedagogical processes (Maggio, 2022; Pierella et al., 2020). Grounded in these perspectives, the teaching profession was operationalized in this study through three distinct dimensions: pedagogical practices, the organizational context, and the use of digital technologies.

Concerning pedagogical practices, this dimension is grounded in a broad conception of university teaching as a set of intentional actions guided by educational objectives and mediated by interactions between faculty and students (Montes Pacheco et al., 2017). These practices encompass planning tasks, instructional strategies, assessment methodologies, and classroom interaction. Furthermore, these practices are frequently rooted in academic traditions that prioritize disciplinary mastery and favor lecture-based formats, within a systemic context where faculty members typically have limited formal pedagogical training, face excessive workloads, and experience a disconnect between their teaching and research duties (Borgobello et al., 2024).

The organizational context dimension captures the working conditions of university faculty. From a multidimensional perspective on labor, this dimension encompasses institutional, contractual, material, temporal, symbolic, and subjective aspects. In Argentina's public universities, the work of faculty teams takes place within a structurally precarious environment characterized by temporary contracts, part-time appointments, multiple job holdings (*moonlighting*), and unstable career paths, further compounded by insufficient salaries and an intensification of workloads that has worsened due to the transition to online teaching recently. Additionally, the subjective experiences of this precariousness manifest in processes of symbolic devaluation, loss of professional recognition, and feelings of job-related unease (Walker, 2024). Other critical factors within this dimension include the internal organization of academic departments, physical infrastructure, technical and pedagogical resources, and institutional teacher-training programs (Fernández-Lamarra and Pérez-Centeno, 2011; Pierella et al., 2020).

In a higher education landscape marked by the sustained incorporation of virtualization processes—which were heavily accelerated by the 2020 pandemic—the dimension of digital technology use becomes highly significant (Lovey and Borgobello,

2025). Due to the COVID-19 pandemic and the subsequent enforcement of Preventive and Mandatory Social Isolation (*Aislamiento Social, Preventivo y Obligatorio*, ASPO), digital technologies became the primary channel for interaction and continuity within educational communities (Copertari, 2020). It is worth noting that the use of virtual classrooms only became fully established among certain groups of teachers and students after the onset of this crisis (Borgobello et al., 2024). Regarding the adoption and integration of digital technologies by educators, several studies have revealed sharp inequalities linked to prior experience, personal attitudes, institutional resistance, and emotional responses (Roatta and Tedini, 2021; Silas and Vázquez, 2020). Furthermore, other research has highlighted issues of accessibility and disparities in access to devices, framing these as matters of educational rights (Borgobello et al., 2024; Guarnieri, 2018). The technical and pedagogical challenges posed by the sudden reliance on Moodle platforms underscored the vital importance of having robust institutional tools, promoting collaborative work, and strengthening teacher training before implementation. This includes recognizing both the platform's potential and its limitations from a democratic perspective of equitable access to knowledge (Lovey and Borgobello, 2025; Santos Sharpe, 2020).

In psychological and educational research, questionnaires are widely utilized as standard instruments for data collection and analysis (Hernández et al., 2008). Recently, several studies have focused on the design and validation of instruments in higher education, employing expert judgment and Aiken's V-coefficient to establish content validity. In the international arena, Álvarez-Álvarez et al. (2022) validated a questionnaire on classroom interaction in university teaching in Spain, while Palomares Ruiz et al. (2023) designed and validated an instrument assessing the "learning to learn" competency with participants from Spain, Mexico, and Chile. Similarly, in the Latin American context, Torres Roldán et al. (2024) presented the design and validation of a questionnaire to assess competency-based teaching performance in postgraduate courses. This body of research demonstrates the consolidation of rigorous content-validation procedures for instruments targeting university instruction, which serve as crucial preliminary stages of psychometric develop-

ment prior to confirmatory factor analysis. Despite these advances, many existing methodological tools tend to focus on isolated aspects of the teaching profession, such as pedagogical practices, isolated competencies, conceptions of learning, or the use of technology (Álvarez Rojo et al., 2009; García et al., 2014; Moreno-Murcia et al., 2015; Tuapanta Dacto et al., 2017). Consequently, they offer little integration across different dimensions and fail to connect these practices with the broader structural conditions and characteristics of university organizations (Borgobello et al., 2024). In this regard, the objective of this study is to present the design, content validation, and initial pilot application of the CODES as a contextualized tool for studying the teaching profession at public universities. The instrument is presented in its preliminary stage of psychometric development, before undergoing confirmatory factor analysis.

2. Methods

This study presents an instrumental research project (Hernández et al., 2008) focused on the design and validation of an *ad hoc*, semi-structured questionnaire: the CODES. The objectives guiding its design were: to identify the pedagogical practices and working conditions of faculty members at the institution; to understand academic needs and attitudes toward online modalities within the context under study; and to describe assessments and uses of digital technologies at a public university. The case university has an enrollment of more than 85,000 students and a faculty of 6,400 members, and is located in central-eastern Argentina.

The instrument was structured around three core dimensions that operationalize the construct of the teaching profession: (1) teaching practices; (2) organizational context (comprising institutional aspects, working conditions, workload, job security, resources, organization, and training); and (3) the adoption and use of digital technologies. Following the framework of Hernández et al. (2008), the design and administration process involved defining the core objectives, reviewing existing literature and instruments (Page et al., 2021; Furguerle et al., 2016), identifying the target variables (teaching practices, academic environment, and virtualization), developing the initial tool, consulting with subject-matter

specialists, conducting a pilot test with university instructors, and analyzing the criteria of reliability, validity, and objectivity. Data collection for the pilot test took place during the second quarter of 2023, with data curation and cleaning performed before conducting the descriptive statistical analysis (Ynoub, 2011).

Regarding the operational definition of the construct, the dimensions of the CODES present indicators associated with specific items, and their formulation was strictly guided by theoretical foundations (Table 1).

Table 1. Operational definition of the CODES: dimensions, indicators, and theoretical basis

Dimension	Indicators and items Associated	Theoretical Theoretical
Teaching Practices	Planning and organization of instruction (items 14D, 17B); teaching and assessment strategies (items 14E, 17H, 18); pedagogical interaction and rapport with students (items 14A, 14B, 14C, 14F, 14G, 14J); teacher performance, motivation, and professional development (items 14H, 15, 17A, 17C, 17D, 17E, 17F, 17G, 17I).	Montes Pacheco et al. (2017); Maggio (2022); Borgobello et al. (2024).
Organizational context	Contractual and workload conditions (items 4, 5, 12, 13); institutional infrastructure and resources (items 16A, 16C, 16D, 16K); recognition, communication, and institutional ties (items 14I, 14K, 16B, 16J, 16L).	Fernández-Lamarra and Pérez-Centeno (2011); Walker (2024); Pierella et al. (2020).
Uses of digital technologies	Availability of devices and basic digital skills (items 19, 25); educational uses of ICT and artificial intelligence (items 20A, 20C, 20D, 20E); communication mediated by digital technologies (items 21, 22, 23, 24).	Copertari (2020); Roatta and Tadini (2021); Guarnieri (2018); Lovey and Borgobello (2025).

Note: Prepared by the authors. Item numbering refers to Table 1.

The CODES was developed for online administration and consists of 66 items, predominantly closed-ended questions using five-point Likert scales (e.g., 1 = *Very poor* to 5 = *Excellent*). It incorporates a central, neutral option (3) to facilitate interpretation and mitigate respondent fatigue (Matas, 2018; Torres, 2022; Urcádiz and Monroy, 2022), alongside an optional open-ended question at the end of each section. Content validity was evaluated through expert judgment (Escobar-Pérez and Cuervo-Martínez, 2008), for which a second online Likert-scale questionnaire was developed to assess the relevance and wording of the CODES items. Researchers holding doctoral degrees, specializations, or specific expertise in psychodiagnostics and instrument design were invited to participate, resulting in a panel of 15 specialists.

For the pilot study, faculty members from various undergraduate programs at the host university were invited to participate, yielding 66 responses from 11 of the 12 academic departments; the programs in Education, Medicine, and Psychology were

excluded as they were designated for subsequent stages of the project. The participants' average age was 44 years, with an average of 15 years of teaching experience, and the majority were first-year faculty members holding full-time positions. For the descriptive analysis, response values were grouped into three categories: unsatisfactory or low-frequency ratings (scores 1 and 2); average or neutral responses (score 3); and satisfactory or high-frequency ratings (scores 4 and 5).

Reliability and validity statistical calculations were performed using R (v. 4.3.2) and RStudio (v. 2023.09.1). Measures of internal consistency included Cronbach's alpha and McDonald's omega. Content validity was assessed using Aiken's V (Robles, 2018; Escobar-Pérez and Cuervo-Martínez, 2008). Aiken's V coefficient was calculated using the formula $V = S / [n(c - 1)]$, where S is the sum of the differences between the score assigned by each panel member and the minimum value on the rating scale, n is the number of panel members, and c is the number of categories on that scale (Robles, 2018). Each of the

26 items in the evaluation questionnaire was rated by the expert panel across two independent criteria—conceptual relevance and clarity of wording—enabling the calculation of an Aiken's V value per item and per criterion (Table 2). Values greater than 0.70 were considered empirical evidence of adequate content validity (Escobar-Pérez and Cuervo-Martínez, 2008). A detailed interpretation of the exploratory factor analysis (EFA) was deliberately omitted from this article due to the size of the pilot sample ($n =$

66), which was limited relative to the total number of items (66 items). Although preliminary analyses were conducted to explore the internal structure of the questionnaire, EFA will be addressed in later stages of the research once the recommended sample size relative to the number of items is achieved. For the final version of the CODES (Table 1), minor wording adjustments were made to statements 7, 9, 10, 12, and 15, and additional response options were incorporated into questions 4, 11, 16, and 18.

Table 1. *Statements, questions, and items of the CODES*

Statements / Questions	Items / Scales
A. Informed Consent	
1. How old are you?	Numeric response
2. What gender do you identify as?	A_Female B_Male C_Non-binary D_I'd rather not say F_Other
3. In which of the following university degree programs do you teach?	A_Education B_Medicine C_Psychology
4. What is your teaching position at the UNR?	A_Second-level teaching assistant (student) B_First-level teaching assistant C_Lab instructor D_Assistant professor E_Associate professor F_Full professor G_Other
5. What is your teaching load?	A_Part-time B_Semi-full-time C_Full-time
6. How many full years of experience do you have in university teaching?	Numeric answer
7. In which department or academic discipline do you carry out your teaching duties?	Short answer
8. In which year of the degree program's curriculum is the course you teach offered?	A_1st B_2nd C_3rd D_4th F_5th G_6th
9. How many hours per week do you spend teaching this course?	Numerical answer
10. Approximately how many students began taking the course with you last year?	Numeric answer
11. Approximately how many students passed (made up their credits and/or advanced) at the end of the course last year with you?	Numerical answer
12. In addition to your teaching job, do you have any other paid jobs?	A_Yes B_No
13. If you have other paid jobs, what do you do?	Short answer (optional)

Statements / Questions	Items / Scales
14. In general, how do you feel about the following aspects?	A_ The support you provide to students in their learning and teaching processes B_ The guidance you provide to students regarding the institution and university life C_ The assistance you offer students in organizing and managing their study time D_ The planning and organization of your classes E_ Your academic standards and criteria for coursework and assessments F_ The respect shown toward students during assessment processes G_ The way you encourage and foster classroom dialogue H_ Your professional satisfaction and enjoyment when going to the university I_ Your institutional connections outside of class (e.g., with administrative and support staff) J_ Your communication and interaction with students K_ Your professional and working relationships with fellow faculty members
15. In general, how do you feel about the following aspects?	A_ In department meetings B_ During your office hours C_ In tutoring or supervision sessions
16. In general, beyond your specific subject area, based on your experience at the college, how would you rate the following aspects?	A_ The functioning of administrative offices and administrative tasks B_ Support and guidance provided by the faculty union C_ The physical infrastructure (e.g., furniture, classroom conditions, and acoustics) D_ Technological devices and resources (e.g., Wi-Fi, computers, projectors, and audio equipment) E_ Workload F_ Course scheduling options G_ Assessment and evaluation procedures H_ Communication between faculty and students I_ Communication and interaction among faculty members J_ Scholarship and funding programs for faculty K_ Non-academic services and activities offered by the university (e.g., dining halls, sports, recreation, and health centers) L_ Academic and teacher-training programs offered by the university (e.g., teaching workshops, seminars, courses, and conferences)
17. How would you rate yourself in relation to the following aspects?	A_ Your own teaching performance B_ The time you devote to class preparation C_ Your motivation to carry out teaching duties D_ Your participation in professional development opportunities offered by the university E_ Your participation in academic conferences and seminars F_ Your compliance with professional and work obligations related to your teaching position G_ Your subject-matter and disciplinary knowledge (specific to the subjects you teach) H_ Your teaching methodologies and approaches I_ Your pedagogical and instructional skills
18. What types of assessments do you assign to your students?	A_ Multiple-choice written exams B_ Written exams with open-ended prompts C_ Individual written assignments D_ Group written assignments E_ Individual oral assessments F_ Group oral assessments G_ Class participation H_ Synchronous virtual sessions (e.g., via video conference) I_ Asynchronous virtual assessments (e.g., forums or assignments on the virtual campus) J_ Other
19. Regarding your teaching work, to what extent do you agree with the following statements?	A_ I have appropriate devices for my teaching tasks (e.g., a computer) B_ I have general knowledge of using digital technologies (e.g., downloading and installing applications, creating and editing files, connecting audio and video) C_ I find it easy to use the virtual campus (UNR Communities) D_ I have good internet access for my academic activities E_ I have received specific training in the use of ICT in teaching
20. In relation to your teaching work, how often do you use the following resources?	A_ Teaching strategies using artificial intelligence (e.g., ChatGPT) B_ ICT for evaluating or assessing students C_ Digital learning resources you have designed yourself (e.g., slide presentations, videos, podcasts, audio files) D_ Digital learning resources designed by others E_ Shared documents for collaborative work with your students (e.g., Google Docs) F_ Shared documents for collaborative work with fellow faculty members in your department or division (e.g., Google Docs) G_ Synchronous online formats (video calls for classes, support, consultations, or tutoring) H_ The virtual campus (UNR Communities)
21. In relation to your teaching work, how often do you use UNR communities to communicate with...?	A_ Your students B_ Your fellow faculty members C_ The administrative offices or departments of your school or the university

Statements / Questions	Items / Scales
22. In relation to your teaching work, how often do you use email to communicate with...?	A_Your students B_Your teaching colleagues C_The administrative offices or departments of your college or the university
23. In relation to your teaching work, how often do you use social media (e.g., Facebook, Twitter/X, Instagram) to communicate with...?	A_Your students B_Your fellow faculty members C_The administrative offices or departments of your college or university
24. In relation to your teaching work, how often do you use mobile instant messaging (e.g., WhatsApp) to communicate with...?	A_Your students B_Your fellow faculty members C_The administrative offices or departments of your college or university
25. In general, how would you rate your skills in using ICTs in an educational setting?	Scale: Very poor – Excellent

Note: Developed in-house. Final version of CODES.

Ethical considerations are governed by the institutions that approved and funded the project, in compliance with Personal Data Protection Law No. 25,326 and the host university's resolutions on research ethics. The project is funded by CONICET, and the authors declare no conflicts of interest.

3. Results

Using the data obtained from the expert judgment (n=15), the validity of the instrument was calculated using Aiken's V, yielding results ranging from 0.96 to 1.00 for each item (Table 2).

Table 2. Content validity indices (Aiken's V) for conceptual relevance and clarity of wording of the 26 CODES statements (A–1 to 25)

Items	Aiken-Relevance (Mean)	Range	Aiken's V – Editorial (Average)	Rank
Item 1	1.00	1.00–1.00	1.00	1.00–1.00
Item A-5	0.99	0.98–1.00	1.00	0.99–1.00
Items 6–10	0.98	0.97–0.99	0.98	0.96–0.98
Items 11–15	0.98	0.98–0.98	0.98	0.98–0.98
Items 16–20	0.99	0.98–1.00	0.99	0.98–0.99
Items 21–25	1.00	1.00–1.00	0.99	0.99–1.00

Note: Author's own calculation. Aiken's V calculated based on expert judgment (n=15). Values greater than 0.70 indicate adequate content validity (Escobar-Pérez and Cuervo-Martínez, 2008).

Additionally, measures of internal consistency were calculated based on the 66 responses from the pilot test, yielding Cronbach's alpha values ranging from 0.79 to 0.87 and McDonald's omega values ranging from 0.83 to 0.91 (Table 3).

Table 3. Internal consistency values for the CODES dimensions

Construct	No. of items	Cronbach's alpha	McDonald's omega
General	66	0.87	0.91
Teaching Practices	29	0.81	0.90
Organizational Context	11	0.82	0.87
Virtualization	26	0.79	0.83

Note: Author's own calculations. α = Cronbach's alpha; ω = McDonald's omega. The values correspond to the pilot administration of the CODES (n = 66).

Descriptive analysis was performed on both quantitative and qualitative variables. The mean age of the participants was 44 years (SD = 11). Regarding gender identity, 71% (n = 47) identified as female, 27% (n = 18) as male, and 2% (n = 1) as non-binary. The average teaching experience was 15 years (SD = 10). In terms of academic ranks, 44% (n = 29) were Senior Teaching Assistants (*Heads of Practical Works*), 29% (n = 19) were Assistant Professors, 18% (n = 12) were Full Professors, 8% (n = 5) were Senior Lecturers, and 2% (n = 1) were Associate Professors. Regarding appointment types, 53% (n = 35) held full-time positions, 23% (n = 15) held mid-time positions, and 24% (n = 16) held part-time positions. Sixty-one percent (n = 40) taught courses in the first through third years of study, averaging five hours of face-to-face class time per week with students (SD = 3). Additionally, 73% (n = 48) held another paid job outside the institution.

In terms of the academic environment, several aspects were positively evaluated: respect shown toward students during assessments (99%, n = 65), professional enjoyment of attending the university (92%, n = 61), and a strong tendency to encourage dialogue in class (91%, n = 60). Most respondents reported feeling very good or excellent during office hours (86%, n = 57), department meetings (81%, n = 52), and tutorials or supervision sessions (76%, n = 50). In contrast, teaching fellowship programs (36%, n = 24), union support (29%, n = 19), and the institution's physical infrastructure and resources (26%, n = 17) were rated negatively, with the latter resource-related aspect being rated as "fair" by 46% (n = 30).

Regarding teaching practices, respondents rated their fulfillment of job duties (92%, n = 61), subject-matter knowledge (89%, n = 59), and motivation to carry out their teaching tasks (88%, n =

58) highly. Participation in professional training opportunities offered by the university was the only item that received predominantly negative assessments (15%, n = 10). Regarding assessment types, the most frequently utilized were written exams with open-ended prompts (67%, n = 44), group written assignments (62%, n = 41), and group oral exams (58%, n = 38). Conversely, multiple-choice exams (61%, n = 40), individual oral exams (38%, n = 25), and individual written assignments (33%, n = 22) were the least commonly used.

Regarding the availability and use of digital technologies, 86% (n = 57) of the respondents stated that they found the virtual campus (Moodle) easy to use. Eighty percent (n = 53) reported possessing general knowledge regarding the use of digital technologies, and 76% (n = 50) indicated that they had a home internet connection of sufficient quality for academic activities. Use of the virtual campus was frequent (82%, n = 54), as was the utilization of digital resources designed specifically for their courses (82%, n = 54) and shared documents for collaborative work with colleagues (70%, n = 46). Conversely, a high percentage of faculty did not utilize instructional strategies based on artificial intelligence (66%, n = 43), nor did they use collaborative documents shared with students (41%, n = 27) or digital technologies specifically for assessment purposes (39%, n = 25).

The virtual campus emerged as the most commonly used channel of communication with students (73%, n = 48), whereas email was the primary medium for communicating with administrative offices (86%, n = 57) and with fellow faculty members (76%, n = 50). Instant messaging was the most widespread communication channel among colleagues (88%, n = 58), but was used significantly less frequently with students (20%, n = 13) and adminis-

trative offices (36%, $n = 24$). Social media was rarely used across all domains, with between 77% ($n = 51$) and 80% ($n = 53$) of respondents indicating they used it rarely or never. Finally, 65% ($n = 43$) of the surveyed faculty expressed a positive self-assessment of their overall digital competencies.

It should be noted that these results correspond to an exploratory analysis conducted during a preliminary stage of the instrument's development, given the limited size of the pilot sample ($n = 66$) relative to the total number of items; therefore, they constitute initial indications rather than confirmatory evidence of the factor structure. The preliminary EFA identified three factors corresponding to the core dimensions of the teaching profession: pedagogical practices (PP), organizational context (OC), and virtualization (V). The most prominent factor loadings corresponded to PP (items 17A with 0.74; 14C with 0.68; and 14A with 0.65), OC (items 16C with 0.70; 16A with 0.67; and 16H with 0.58) and V (items 25A with 0.71; 19B with 0.66; and 20C with 0.59). Items with weak loadings (below 0.30) were also identified, such as PP 14H (0.23), 14I (0.26), and 15B (0.29), as well as several items from the V dimension (18A, 18B, 18C, 21A, 22A) which exhibited low loadings across all factors. In addition, cross-loadings were observed for items PP 14E (0.46 on PP and 0.47 on OC) and V 20B (0.49 on V and 0.37 on PP).

4. Discussion and Conclusions

The results of the CODES pilot test demonstrated the theoretical and empirical relevance of the dimensions selected to operationalize the teaching profession in higher education. The practice of teaching in higher education can be understood as a complex, historical, and situated practice shaped by contextual, occupational, and pedagogical factors, consistent with the arguments put forward by Dubet (2006), Alliaud and Antelo (2009), and Alliaud (2014). The interplay of these variables is pivotal for understanding the ways in which teaching and learning processes take shape within public universities. It is worth noting that this landscape has undergone structural transformations recently due to increasing virtualization and the rapid development of generative artificial intelligence, both of which have had profound repercussions on institutional enrollment

and student retention (Coulon, 2019; Johnston, 2013; Silva Laya, 2015; Tinto, 1993; Vercellino, 2021).

Concerning faculty performance, the persistence of traditional teaching practices was evident, reinforced by the centrality of disciplinary knowledge (Borgobello et al., 2024; Fernández Lamarra and Pérez Centeno, 2011). This trend was reflected in the predominant assessment methods—such as written assessments with open-ended questions and group projects—and in the limited incorporation of digital technologies or artificial intelligence tools into classroom instruction. These results can be interpreted as a disconnect between organizational discourses that promote innovative techno-pedagogical perspectives and their actual, effective implementation (Lovey and Borgobello, 2025). In this context, virtualization appears to function as a recontextualization of pre-existing educational formats rather than a profound redefinition of pedagogical concepts (Furguerle et al., 2016; Maggio, 2022).

Faculty participation in professional development opportunities takes on deeper meaning when viewed in relation to the systematic underfunding of public universities in Argentina. Consistent with Walker's (2024) argument, opportunities to access didactic and pedagogical training are severely constrained by working conditions characterized by excessive workloads, holding multiple jobs (*moonlighting*), and full-time employment commitments. Even when commitment and motivation toward professional development are evident, the situated construction of knowledge is heavily conditioned by structural and material factors that go far beyond individual choices (Alliaud and Antelo, 2009; Borgobello et al., 2024).

Previous research on the working conditions of university faculty in Argentina is highly consistent with the findings of this study. As mentioned earlier, the high number of faculty members holding multiple jobs and high teaching workloads reaffirm the situation of structural precariousness that characterizes university faculty (Walker, 2024). The data revealed the multidimensional and unequal nature of this precariousness. Positive evaluations were observed regarding the academic climate, respect for students, and a strong sense of organizational belonging. However, notable criticisms were raised regarding the infrastructure and physical resources available for carrying out teaching duties. The coe-

xistence of these faculty assessments can be interpreted as a complex experience of precariousness, which combines a high level of professional commitment with inadequate material conditions, ultimately resulting in limited opportunities for professional development.

In line with Walker (2024), the results allowed us to distinguish between “being in” a precarious situation—as expressed in job stability, resources, and teaching dedication—and “feeling” that precariousness, which relates to recognition, organizational support, and future career prospects for teachers. This echoes Dubet’s (2006) view of teaching as a process of subjectivation and socialization shaped by demands that can often be contradictory. The inclusion of the organizational environment dimension in the CODES was crucial for capturing these vital variables of the teaching profession that extend beyond individual pedagogical practices.

Regarding the use of digital technologies and in line with the literature reviewed (Lovey and Borgobello, 2025; Santos Sharpe, 2020; Sotelo, 2025), the results indicated a basic and uneven adoption of these tools, with the institutional virtual campus serving as the primary medium of communication between faculty and students. Despite this, the integration of more complex technologies and opportunities for innovation in assessment remain limited. Once again, the development of digital competencies among faculty is intrinsically linked to working conditions, university training programs, and the recognition of teaching and learning processes as the central dimension of the teaching profession (Maggio, 2022).

Moving beyond the instrumental uses of technologies and individual teaching skills requires institutional policies that promote a critical, reflective, and pedagogically situated integration (Guarnieri, 2018). In this sense, the techno-pedagogical uses identified by CODES can be interpreted as a situated expression by the teaching faculty regarding digital skills—understood as pedagogical, relational, and organizational knowledge emerging from specific institutional contexts.

The empirical evidence reinforced the idea of a close relationship between the teaching role and processes of student institutional affiliation. As argued by Tinto (1993) and Coulon (2019), college retention depends on academic experiences media-

ted by pedagogical practices, forms of assessment, interactions, and organizational conditions that go beyond individual student variables. In line with these perspectives, the three dimensions identified by the CODES could deepen our understanding of student phenomena that occur primarily during the first years of college and contribute to increased dropout rates (Silva Laya, 2015).

The pilot administration of the CODES and the analysis of the internal consistency of the responses provided preliminary evidence of the instrument’s content validity and contextual appropriateness. This study presented the design of the CODES alongside its preliminary validation and reliability. The scores obtained from expert review allowed for reflection on content validity in terms of both conceptual relevance and clarity of wording. Furthermore, the results of the pilot test confirm the relevance and empirical sensitivity of the proposed dimensions for capturing the complexity that characterizes the teaching profession at public universities. It should be noted that, although the preliminary results of the EFA were limited by the sample size, they provided initial evidence for construct validity and guided the revisions that led to the final version.

This exploratory study opens the door to further research using methodological designs with different characteristics and larger samples, which would enable the validation of the instrument for the situated analysis of the various dimensions that make up the teaching profession. In this regard, future research could focus on confirmatory factor analysis, on deepening the discussion regarding the structure emerging from the EFA, and on studying the relationship between the dimensions of the CODES and variables related to university admission, institutional affiliation, and student retention.

The instrument presented in this study is considered a valuable resource for data collection in research involving university faculty, contributing to reflection on the importance of public policies aimed at improving their working conditions. The study of the teaching profession holds strategic value for the design of policies aimed at democratizing equitable access to higher education, particularly in the context of the underfunding of Argentine public universities and deepening social inequalities.

Given the current situation of Latin American public universities—marked by structural changes

and the delegitimization of academic work—the CODES is proposed as a tool for critically analyzing organizational policies regarding teacher training, work organization, and the use of digital technologies, in relation to student admission and retention processes at the university. Recognizing the tensions between professional commitment, working conditions, and institutional demands is key to understanding the complexity of the teaching profession. This is essential for building a public university that is more inclusive and equitable, and capable of supporting diverse student trajectories in hostile contexts that threaten public education.

Research Funding and Support

Organization: National Scientific and Technical Research Council (CONICET)

Country: Argentina

City: Rosario

Funded project: Challenges of University Admission and Retention in an Era of Increasing Virtualization of Teaching and Learning Processes

Project code: 14120210100517CO01

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Authorship Statement – CRediT Taxonomy

Authors	Contributions
Juan Pablo Lovey	Funding acquisition; conceptualization; data curation; formal analysis; research; methodology; validation; visualization; writing—original draft; and writing—revision and editing.
Dr. María Paula Pierella	Funding acquisition; conceptualization; methodology; and writing—review and editing
Dr. Ana Borgobello	Funding acquisition; conceptualization; methodology; and writing—review and editing.

Statement on the Use of Artificial Intelligence

The authors DECLARE that during the preparation of the article “*Design and Validation: CODES Questionnaire on Teaching at the University*,” an open-access artificial intelligence tool developed by the Universidad Iberoamericana in Mexico was used to promote the use of inclusive language and gender-sensitive writing. The tool is available at: <https://lenguaje-incluyente.ibero.mx/>
