



Self-perception of Teaching Difficulties in Prospective Teachers: Adaptation of the Teaching Problems Inventory

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The aim of this article is to analyze the psychometric properties of an abbreviated version of the Teaching Problems Inventory. For this purpose, the scale is subjected to a previous exploratory factor analysis to statistically examine the underlying constructs. Previously, a confirmatory factor analysis was performed and a new grouping into dimensions was generated. To analyze the properties of the items, descriptive statistics were performed: mean, standard deviation and inter-item correlations. To study the psychometric properties of the scale, Cronbach's alpha, Exploratory Factor Analysis (EFA) -to identify the latent structure of the variables-, and Confirmatory Factor Analysis (CFA) were used as a procedure to check the results of the EFA. As recommended, participants were randomly divided into two groups to perform the AFE with one group and the AFC with the other to avoid distortions Participant: the proportion of items, sample size, normality, linearity, and correlation between variables were checked as assumptions for the factor analysis. The sample consisted of 992 undergraduate teacher training and master's degree students from different Spanish regions: Valencia, Andalusia, Catalonia, Madrid, Castilla la Mancha, and Castilla y León. The results of the different reliability and validity analyses showed that the reduced scale has higher reliability values and is still sensitive to capture gender and age scoring difference. As a conclusion, the consistency of the instrument to evaluate the teaching difficulties of students of different degrees and postgraduate degrees in education is highlighted. As for the limitations, the elimination of 2 items relevant at a theoretical level stands out: Motivating students in school tasks and Discipline problems with students/groups of students.

Keywords: teaching difficulties, inventory of teaching problems, teacher training master, teacher education, master students

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INTRODUCTION

Teachers are a key element in education. Therefore, knowing their teaching difficulties and developing training processes to alleviate these shortcomings improves teaching quality. Historically, some authors have focused on discovering these difficulties in different teaching collectives: novice, expert, science, ... (Veeman, 1984; Arroyo et al., 2021; Chan & Rodríguez-Pech, 2020; Jara, 2020; Rubio & Olivo, 2020). In this sense, it is also important to know the difficulties that undergraduate and graduate education students foresee, to be able to introduce improvements in the different curricula.

Since the McKinsey Report (Barber & Mourshed, 2007) stated that teachers are the most influential factor in the quality of the education system, studies have multiplied their competencies to manage the teaching-learning process (Enkvist, 2016; Hattie, 2017; Day, 2019). The analysis of their difficulties for teaching is a recurrent and emerging theme, at the same time. These teaching difficulties are defined as those aspects that hinder the correct performance of teachers, in relation to all aspects that encompass their professional work (classroom management, time, learning, resources, personal and professional relationships with peers and families, their fears, ...).

To know what the perception is concerning teachers about their professional work is approached from different perspectives. On the one hand, the analysis of concerns presented by novice teachers (Veenman, 1984; Marcelo, 2008; Eirín et al., 2009; Imbernón, 2019). This research with novice teachers highlights difficulties in maintaining classroom discipline, motivating students, personalizing instruction, organizing and planning content, and relating to families and peers. These same difficulties have appeared in our research. In addition, Marcelo (2008) also highlights the importance of professional insertion programs -training- to respond to the teaching difficulties presented by novice teachers. Other research analyzes the difficulties in the rural environment (Sánchez-Sánchez and Jara, 2019), the university (Fondón et al., 2010), or at different educational levels or specialties (Arroyo et al., 2021; Cuesta and Azcárate, 2005; Flores, 2015; Jara, 2020). On the other hand, other studies analyze the difficulties of teachers in general, taking their teaching functions as a reference (Rubio-Hernández and Olivo-Franco, 2020; Vázquez, 2016) or the difficulties they have faced during the pandemic (Chan and Rodríguez-Pech, 2022).

Different instruments have been used to analyze the difficulties of teachers. For example, the Jordell (1985), Marcelo (2008) or Cañón (2012) questionnaires analyze the difficulties of novice teachers. Marcelo (2008) and Cañón (2012) use Teaching Problems Inventory (Jordell, 1985) adapted. Marcelo reduced the questionnaire from 68 to 55 items, classifying it into 8 dimensions: teaching, planning, evaluation, resources, environment, time, relationships, and personnel. Cañón regrouped it into 4 dimensions: academic, organizational, social, and material-technological difficulties.

Cardona's instrument (2008) analyzes the difficulties of teachers, without considering issues of professional experience with 83 items in 7 dimensions: planning, methodological, advisory, tutorial, evaluative, modeling, research and professional development and management. More recently, Ravanal et al. (2017) have validated a Professional Concerns about Teaching Biology questionnaire, composed of 23 items in three dimensions: teacher-centered, content-centered, and student-centered.

In recent years, another trend has emerged that analyzes the difficulties and/or problems foreseen by teacher training and teacher education master's degree students (Sanz et al., 2022a; Sanz et al., 2022b; Sanz et al., 2023) prior to their entry into the labor market. This research, which analyzes the self-perception of future teachers about teaching problems, has a double usefulness. On the one hand, it helps prospective teachers to reflect on educational practice (reflective practice) (Brady, 2020) and to highlight the most relevant and conflicting aspects (Bolfvar, 2019). On the other hand, this trend may favor the inclusion of training measures in the initial teacher training process itself, thus improving their incorporation into the professional career. These aspects make this research important and urgent, since they affect a key aspect for the quality of the educational system, namely teacher training. The transition from student to teacher occurs, on many occasions, abruptly, without an adaptation period -"transition shock" (Brower, 1987)- and without mentoring by more experienced teachers (Solis et al., 2016). In this sense, the incorporation of new teachers into the professional world can generate what Veenman (1984) defined as a "reality shock" that causes demotivation, insecurity, or avoidance of innovative pedagogical approaches. The teacher learns to be a teacher alone, unprotected and lost, facing his fears, worries and difficulties without help (Ruffinelli et al., 2017). Even more so today where social and educational changes are occurring at breakneck speed, raising new issues: diversity in the classroom, new personal and educational needs of students, attention to vulnerable groups due to the consequences of the COVID-19, and the successive economic crises, the introduction of ICTs in schools, ... And in their previous university training process, there are serious difficulties of disconnection between teachers and practice (Arcas and Sanchez, 2024) that should be solved. Komariah et al. (2023) have verified the self-sufficiency of the university professor of education and his ability to work, regardless of his competence. However, what is evident (Rrustemi and Kurteshi, 2023) is that, in the training programs of future teachers, internships are the best valued as enabling their professional future. Above all, because they have been able to put their knowledge into practice and have faced various challenges. However, students also recognize that, to achieve this, they need a favorable environment and mentors who care about them.

After these investigations, in which Cañón's (2012) version of the Teaching Problems Inventory was used, we aimed to: (a) adapt this instrument to the group of students of the Teaching Degree and the Master's Degree in Teacher Training, (b) reduce the number of items, with the intention of making it more manageable, simple and quick, eliminating those redundant items or irrelevant information. To this end, the scale will be subjected to a previous exploratory factor analysis, to examine the underlying constructs in a statistical way, before performing a confirmatory factor analysis. This analysis will generate a new grouping into dimensions.

METHOD

The aim of this article is to analyze the psychometric properties of an abbreviated version of the Teaching Problems Inventory. For this purpose, the scale is subjected to a previous exploratory factor analysis to statistically examine the underlying constructs. Previously, a confirmatory factor analysis was performed and a new grouping into dimensions was generated. To analyze the properties of the items, descriptive statistics were performed: mean, standard deviation and inter-item correlations. To study the

psychometric properties of the scale, Cronbach's alpha, Exploratory Factor Analysis (EFA) -to identify the latent structure of the variables-, and Confirmatory Factor Analysis (CFA) were used as a procedure to check the results of the EFA. As recommended, participants were randomly divided into two groups to perform the AFE with one group and the AFC with the other to avoid distortions Participant: the proportion of items, sample size, normality, linearity, and correlation between variables were checked as assumptions for the factor analysis.

Participants

In this research 992 students of the Teacher Training Degree and Master's Degree in Teacher Training from different Autonomous Communities participated: Valencia (66.7%), Andalusia (32.6%), Catalonia (0.2%), Madrid (0.2%), Castilla la Mancha (0.2%) and Castilla y León (0.1%). The sample is mostly composed of women (63.1%), while men are represented by 36.9%. These data coincide with the representativeness between men and women graduates of Teacher degree and the master's degree in Teacher Training, as well as with the percentage of teachers (men and women) at the national level for the 2019-2020 academic year (Ministry of Education and Teacher Training, 2021). In terms of age, the majority are between 24 and 26 years old (36.8%), followed by students aged 21 to 23 (27.8%). The least numerous group is 18-20 years old, with 17% (Table 1).

Table 1
Sample of research participants

	Total sample (N=992)		Group 1 (N=476)		Group 2 (N=516)	
	N	%	N	%	N	%
Age						
18-20 years	169	17.175	85	17.857	84	16.279
21-23 years	276	28.049	123	25.840	153	29.651
24-26 years	365	37.093	172	36.134	193	37.403
27 or more	174	17.683	93	19.538	81	15.698
Missing	8	0.806	3	0.630	5	0.969
Total	992	100.000	476	100.000	516	100.000
Sex						
Male	364	36.768	189	39.706	175	33.915
Female	626	63.232	286	60.084	340	65.891
Missing	2	0.202	1	0.210	1	0.194
Total	992	100.000	476	100.000	516	100.000
Secondary						
No	261	26.337	113	23.739	148	28.682
Yes	730	73.663	363	76.261	367	71.124
Missing	1	0.101	0	0.000	1	0.194
Total	992	100.000	476	100.000	516	100.000

Instruments

The Teaching Problems Inventory (Cañón, 2012) was used, divided into 4 dimensions: Academic, Organizational, Social and Material-Technological Difficulties. In our study, the classification by Cañón (2012) was used, with a 5-point rating (1=No difficulty to 5=Great difficulty). The relation item-dimension is presented in Table 2.

Table 2
Relation of items according to the factors

Organizational Difficulties (F2)	1. Maintain proper academic organization in the classroom.
	2. Organize some activities in class (e.g.: group work, theater, ...).
	12. Being pressured by the time in which the contents have to be covered.
	13. Deciding how much content to teach
	14. Scheduling a lesson for one day
	16. Organizing the daily work of the class
	28. Not having enough free time to devote to the students
	40. Having insufficient information about school rules and routines
	42. Having encountered more difficult working conditions than other professionals in the school (larger class sizes, worse, heavier teaching loads)
	45. High number of students in class
Academic Difficulties (F1)	46. Shortage of departments and reading areas in school
	47. Finding time to prepare materials
	48. Finding time to read professional books and journals
	51. Distance of the school from my home
	3. Motivate students in their schoolwork.
	4. Explaining lessons to students
	5. Introducing new teaching-learning activities.
	6. Treating students in a differentiated and individualized way.
	7. Be creative in teaching
	9. Know what students already know
Material-technological Difficulties (F4)	10. Know at what level to present the content
	11. Knowing what content to emphasize or break down further.
	18. Making content mistakes when I am explaining
	19. Not having enough knowledge of the subject(s) I am teaching.
	20. Taking exams
	21. Assessing the learning level of the students
	22. To know if my teaching is effective
	8. Choose textbook
	17. Use of teaching aids (slides, videos, newspapers, computers...)
	27. Encountering rejection by students when I carry out teaching methods they are not used to using.
Social Difficulties (F3)	33. Encountering resistance or skepticism from parents when trying new teaching methods.
	39. Having insufficient information on how to locate teaching materials
	41. Arousing skepticism or resistance from peers or principal when attempting to develop new teaching methods
	44. Shortage of teaching materials in the school.
	23. Defining my role as a teacher
	24. Knowing if the students like me
	25. Making personal contact with the students
	26. Having to be stricter with the students than I would like to be.
	29. Discipline problems with students/groups of students.
	30. Not having enough information about the students and their home environment.
31. Relationships with parents	
Social Difficulties (F3)	32. Finding parents indifferent
	34. Disagreements in relations with parents
	35. Cooperating with peers
	36. Having the opportunity/time to talk to peers
	37. Feeling poorly integrated professionally in school and among classmates
	38. Professional disagreements with peers
	43. Disagreements in relations with the school principal
	49. Finding time to spend with family and friends
	50. Keeping my private life separate from the school
	52. Establish new relationships in the school environment.
53. Limitations of the work location with respect to cultural activities, services, communications, etc.	
54. Quality of accommodation	
55. Being preoccupied with day-to-day teaching	

Procedure

The questionnaire was sent to students of the Teacher Training Degree and Master's Degree in Teacher Training, during the 2021-2022 and 2022-2023 academic years, from different universities in the Valencian Community and Andalusia. Participation was voluntary and anonymous. They were previously informed of the procedure, objective and purpose of the research.

Data analysis

Descriptive statistics of mean, standard deviation, and item correlations were conducted using the SPSS v. 24.0 (IBM, 2019) to analyze the item properties. To study the psychometric properties of the scale we used Cronbach's alpha, Exploratory Factor Analysis (EFA) -to identify the latent structure of the variables-, and Confirmatory Factor Analysis (CFA) as testing procedure of the EFA results (Pituch & Stevens, 2015). As recommended, participants were randomly divided in two groups to conduct EFA with one group and CFA with the other to avoid distortions (García-Alba et al., 2021; Izquierdo et al, 2014). Group 1 consisted of 476 participants (47.98%) and was used to run the EFA and group 2 included 515 participants (52.02%) and was selected to run the CFA. Participant: item ratio -at least 10 cases per item- (Bryant & Yarnold, 1995), sample size -over 300 cases- (Norušis, 2008), absence of outliers, linearity and correlation between variables -above .30- (Tabachnick & Fidell, 2001) were also checked as assumptions for factor analysis (Tabachnick & Fidell, 2019).

For the EFA, the FACTOR software (Ferrando & Lorenzo-Seva, 2017) was used, as it allows performing a Robust Unweighted Least Squares (RULS) extraction method, which is recommended for our ordinal type of data (Forero et al. 2009, Yang-Wallentin et al., 2010). We used a parallel analysis with 500 bootstrap samples and a direct Oblimin rotation (Lloret-Segura et al., 2014). Loadings above .40 were considered. First, the sampling adequacy was analyzed through Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity. Values over 0.5 for KMO (Tabachnick & Fidell, 2007), and under .05 for Bartlett's test (Kaiser, 1974) indicating adequate values. In our sample, values of Bartlett's statistic=4817.5 (df =321; $p < .001$) and KMO = 0.884 [BC Bootstrap 95% CI= (0.878-0.989)], suggesting a good sampling adequacy.

To assess model EFA's model fit we analyzed the comparative fit index (CFI) and Tucker-Lewis index (TLI), with values above 0.90 indicating an adequate fit. We also calculated the root-mean-square error of approximation (RMSEA), with values of 0.08 indicating acceptable model fit (Hu & Bentler, 1999). In addition, the standardized root-mean-square residual (SRMR) was considered, indicating a good fit with values under 0.08 (Hu & Bentler, 1999; Kline, 2005) and acceptable with values under 0.10 (Kline, 2005).

For the CFA, the Jamovi Software (The Jamovi Project, 2022) was employed. Diagonally weighted least squares (DWLS) estimation was used for our ordinal data. Fit statistics such as Chi-square, RMSEA CFI, and TLI were also considered to assess model fit (Hu & Bentler, 1999). Three CFAs were performed. The original four-factor solution with 55 items and the reduced version with 22 items falling into the original four-factor solution were compared with the reduced 22-item five-factor solution.

The abbreviated version of an existing tool is based on items that have already been designed, screened, and tinkered. Therefore, within the phases of test development and validation -which include phases of construct formulation and several kinds of item design, selection, and analysis- (Anastasi, 1986), this study focuses on the phases of empirical item analysis, including factor analysis for determining item clusters or subsets, determining reliability and different types of validity information.

Specifically, the reliability was analyzed through both Ordinal and Cronbach's alpha. Construct validity was examined through EFA and CFA. Convergent validity was assessed by with the estimates of the CFA -loadings of each item with the latent variable over .70- (Gerbing & Anderson, 1988), and discriminant validity was assessed using the Heterotrait-Monotrait ratio of correlations -HTMT- (Roemer et al., 2021). Levels under 0.90 of discriminant validity (Hair & Alamer, 2022), indicate a sufficient degree of convergent validity.

Pearson correlation was used to assess the relationships between the scale factors. Finally, Student t test and ANOVA analyses were performed to analyze the instrument's statistical sensitivity to capture differences in critical variables documented in the literature for teaching difficulties, such as gender and age (Sanz et al., 2023). In addition to probability values with 95% confidence interval, Cohen's d effect size values, were calculated, corresponding with .20, .50 and .80 for small, medium, and large effect sizes, respectively. For ANOVA post-hoc comparisons, Bonferroni corrections were applied to avoid Type-I error. Eta squared (η^2) values of .10, .25 and .37 indicated small, medium, and large effect sizes, respectively (Goss-Sampson, 2020).

FINDINGS

The factor analysis process began with the introduction of all the items of the scale (N=55) and the exploratory analysis. However, not all items saturated above .40 on a factor after being rotated following the procedures described above. In addition, several items saturated on more than one factor above .30 (Howard, 2016). In total, 33 items were eliminated for these reasons. The exploratory analysis was repeated after the elimination of items with double loadings, and, after that, items with factor loadings below .40 were eliminated one by one, repeating the EFA after each elimination (Izquierdo et al., 2013). The criterion of retaining the items with the highest saturation with the factor and establishing a minimum of 3 items per factor was applied (Ferrando & Anguiano-Carrasco, 2010). The final structure of the scale was 22 items grouped into 5 factors.

The results of the EFA, the results on the final list of 22 in 5 dimensions indicated optimal fit values: RMSEA=.045(.029-.050); SRMR=.034 (0.031-0.035); χ^2 (df=231) =11525.008; CFI=0.989; TLI=0.980. Table 3 presents the factor loadings of the EFA by parallel analysis with RULS extraction and Direct Oblimin rotation. The results suggested 5 factors with several items ranging from 3 to 6. Factor loadings were above .43 for all factors. Average interitem correlation ranged between .49 (Factor 4) and .55 (Factor 1).

In addition, descriptive statistics were analyzed at the item-level and the correlation of each item with the rest of each dimension. The most highly scored factor was F5, with

an average of 3.39 (SD=0.90) while the lowest was F3 (M=2.16, SD=0.79). The total scale showed an average score of 2.68 (SD=1.09). The contribution of the items to the overall scale was good. The internal consistency indicators of the scores by Cronbach's Alpha showed values for the factors between 0.76 (F1) and 0.84 (F2), indicating good internal consistency. The α if each of the items was eliminated was studied. The deletion of any item did not result in an increased reliability of the scores in all five dimensions. In addition, to analyze a statistic more adjusted to ordinal data, the Cronbach's α information was complemented by calculating the ordinal Alpha for each factor and for the total. The total scale showed an ordinal Alpha=0.91 (average inter-item correlation $r=.32$).

Table 3
EFA factor loadings with item characteristics and reliability analyses

Variable	F1 ($\alpha=.763$)*	F2 ($\alpha=.844$)	F3 ($\alpha=.831$)	F4 ($\alpha=.796$)	F5 ($\alpha=.827$)	M	SD	r	α^* if deleted
Item9	0.463					2.422	1.031	0.554	0.728
Item10	0.735					2.799	1.003	0.682	0.580
Item11	0.693					2.559	0.991	0.552	0.728
Item14			0.427			2.335	1.073	0.624	0.800
Item16			0.456			2.352	1.065	0.632	0.798
Item17			0.488			2.015	1.071	0.572	0.810
Item25			0.659			2.149	1.090	0.572	0.811
Item35			0.766			2.004	1.044	0.590	0.807
Item36			0.794			2.081	1.039	0.626	0.800
Item32					0.729	3.416	1.063	0.662	0.784
Item33					0.773	3.389	1.021	0.714	0.731
Item34					0.759	3.378	1.012	0.677	0.768
Item37		0.561				2.712	1.224	0.635	0.816
Item38		0.539				2.791	1.067	0.630	0.817
Item39		0.704				2.782	1.139	0.622	0.818
Item40		0.794				2.571	1.098	0.613	0.820
Item41		0.598				3.066	1.054	0.608	0.821
Item43		0.541				2.923	1.092	0.632	0.816
Item47				0.658		2.902	1.117	0.664	0.719
Item48				0.708		2.960	1.133	0.553	0.770
Item49				0.837		2.740	1.232	0.672	0.711
Item50				0.497		2.589	1.268	0.548	0.776
Ordinal alpha	0.801	0.864	0.866	0.831	0.864				
Eigenvalue	7.251	2.411	1.563	1.344	1.298				
% of variance	32.96	10.96	7.10	6.11	5.90				
Cumulative %	32.96	43.92	51.02	57.13	63.03				

Note: *Chronbach's Alpha values.

The correlations between factors showed statistically significant relations between all factors ($p<.001$). The effect size of the relations ranged from small to medium, indicating the absence of collinearity (Table 4).

Table 4
Pearson correlations between factors

	F1	F2	F3	F4	F5
F1	—				
F2	0.325 ***	—			
F3	0.449 ***	0.469 ***	—		
F4	0.316 ***	0.386 ***	0.452 ***	—	
F5	0.283 ***	0.445 ***	0.277 ***	0.305 ***	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Confirmatory Factor Analysis

As the next step, a CFA was conducted with the second group of participants. Table 6 compares the fit of the data of three different solutions: the original 4-factor solution with all 55 items [$\chi^2 = 5523.58$ $df = 1371,000$, $\chi^2/df = 4.01$, $p < .001$, CFI = .596, IFI = .578, RMSEA = .80(.078-.083)], the reduced version with 22 items fitting the original 4-factor distribution of items [$\chi^2 = 1567.910$, $df = 164$, $\chi^2/df = 9.56$, $p < .001$, CFI = .648, IFI = .592, RMSEA = .134(.128-.140)], and the reduced 22 items with the 5-factor solution suggested by the EFA [$\chi^2 = 266.712$, $df = 199$, $\chi^2/df = 1.13$, $p < .001$, CFI = .992, IFI = .991, RMSEA = .026(.017-.034)]. Results showed inadequate fit for the 4-factor solutions. The reduced 5-factor solution, however, showed a good fit of the data to the model suggested by EFA.

The CFA results revealed factor loadings between .65 (item 9) and .76 (item 10) on Factor 1, between .73 (item 43) and .88 (item 37) on Factor 2, between .64 (item 17) and .79 (item 37) on Factor 3, between .76 (item 48) and .88 (item 49) on Factor 4, and between .76 (item 34) and .87 (item 33) on Factor 5. All parameter estimates were statistically significant, indicating that all items contributed significantly to the latent variable they belonged. This was an indicator of convergent validity.

Table 5
Factor loadings from the CFA

Factor	Indicator	Estimate	SE	z	p	95% CI	
						Lower	Upper
Factor 1	Item9	0.648	0.051	12.682	< .001	0.547	0.748
	Item10	0.757	0.044	17.304	< .001	0.672	0.843
	Item11	0.751	0.049	15.203	< .001	0.655	0.848
Factor 2	Item37	0.875	0.049	17.756	< .001	0.779	0.972
	Item38	0.809	0.042	19.043	< .001	0.726	0.892
	Item39	0.792	0.047	16.719	< .001	0.699	0.884
	Item40	0.755	0.047	16.237	< .001	0.664	0.846
	Item41	0.775	0.049	15.924	< .001	0.679	0.870
	Item43	0.728	0.045	16.011	< .001	0.639	0.817
Factor 3	Item14	0.776	0.047	16.663	< .001	0.685	0.867
	Item16	0.756	0.044	17.074	< .001	0.669	0.843
	Item17	0.644	0.051	12.675	< .001	0.544	0.743
	Item25	0.646	0.051	12.641	< .001	0.545	0.746
	Item35	0.700	0.050	14.075	< .001	0.603	0.798
	Item36	0.785	0.044	17.946	< .001	0.699	0.871
Factor 4	Item47	0.863	0.048	18.094	< .001	0.770	0.956
	Item48	0.757	0.053	14.415	< .001	0.654	0.860
	Item49	0.881	0.050	17.641	< .001	0.783	0.978
	Item50	0.851	0.053	15.929	< .001	0.747	0.956
Factor 5	Item32	0.842	0.053	15.972	< .001	0.739	0.945
	Item33	0.865	0.045	19.286	< .001	0.777	0.953
	Item34	0.763	0.047	16.351	< .001	0.671	0.854

Finally, for discriminant validity the Heterotrait-Monotrait Ratio of Correlation (HTMT) was calculated. The results on table 6 showed that all values were below .90, and the range was from .256 (between Factors 3 and 4) to .624 (between Factors 5 and 5), indicating the absence of discriminant validity issues in the measurement model.

Table 6
Heterotrait-monotrait ratio

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	1.000				
Factor 2	0.522	1.000			
Factor 3	0.505	0.567	1.000		
Factor 4	0.533	0.424	0.256	1.000	
Factor 5	0.426	0.502	0.624	0.284	1.000

All factor covariances were statistically significant and positive ($p < .001$) in all cases, indicating the variables tend to increase or decrease together instead of independently. All covariances between each pair of variables were less than .80, indicating the

absence of collinearity. Figure 1 shows the estimates and significance values. Residual item-level variances ranged from 0.324 (item 33) and 0.862 (item 37).

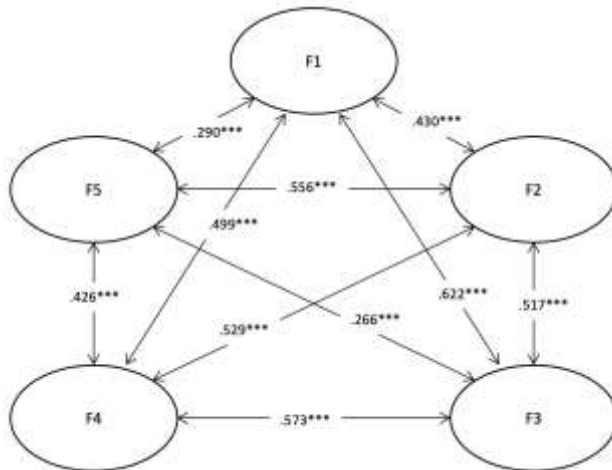


Figure 1
Unstandardized factor covariances

Statistical Sensitivity to gender and age

Student's t-tests were performed to compare teaching difficulty scores by gender. The results indicated statistically significant differences in factor 1 [$t(987)=2.18, p<.05; d=.14$], factor 3 [$t(988)=6.00, p<.001; d=.40$] and factor 5 [$t(986)=-2.33, p<.05; d=.15$]. These differences pointed to greater concern on the part of boys in factor 1 and factor 3, as well as greater concern on the part of girls in factor 5. These differences were statistically significant with small effect sizes. No differences were found in the rest of factors.

Finally, ANOVA analyses were used to analyze differences according to age. The results indicated that statistically significant differences existed in factor 1 [$F(3, 976)=6.15; p<.001, \eta^2=.02$], factor 3 [$F(3, 980)=7.72; p<.001, \eta^2=.04$] and factor 4 [$F(3, 976)=11.73; p<.001, \eta^2=.04$]. Post-hoc analyses revealed that these differences were due to the lower score of the 18 to 20 years age group in all cases with respect to the rest of the age groups. These differences were statistically significant after Bonferroni correction with moderate to large effect sizes, even though at the factor level the eta squared sizes were small. These results pointed to a lower perception of teaching difficulties in the younger age group.

Table 7
Differences in teaching difficulties as a function of age on each factor of the reduced scale

Age	N	Mean	SD	SE	df	Mean Square	F	p	η^2
F1									
18-20	169	2.370	0.722	0.056	3	4.163	6.146	< .001	0.018
21-23	276	2.535	0.831	0.050					
24-26	365	2.668	0.890	0.047					
27 or more	173	2.677	0.753	0.057					
F2									
18-20	169	2.808	0.954	0.073	3	0.260	0.362	0.780	0.001
21-23	273	2.828	0.887	0.054					
24-26	365	2.815	0.807	0.042					
27 or more	174	2.890	0.748	0.057					
F3									
18-20	169	1.892	0.742	0.057	3	7.722	12.821	< .001	0.038
21-23	276	2.099	0.814	0.049					
24-26	365	2.242	0.800	0.042					
27 or more	174	2.368	0.691	0.052					
F4									
18-20	168	2.426	0.880	0.068	3	11.726	13.821	< .001	0.041
21-23	273	2.705	0.953	0.058					
24-26	365	2.850	0.917	0.048					
27 or more	174	3.030	0.916	0.069					
F5									
18-20	169	3.359	0.946	0.073	3	1.326	1.662	0.174	0.005
21-23	274	3.328	0.877	0.053					
24-26	365	3.379	0.899	0.047					
27 or more	174	3.515	0.852	0.065					

DISCUSSION

Due to the impact of teachers on the quality of education and on the personal and academic development of students, it is necessary to address the problems that affect them in their professional development. It is even necessary to detect them as early as possible in their training process. Therefore, the aim of this work is to validate and adapt a shorter and more reliable version of the Teaching Problems Inventory, which detects the problems and helps to establish compensatory measures (Jordell, 1985).

This questionnaire has been used in different studies (Jordell, 1985; Marcelo, 2008; Cañón, 2012; Sanz et al., 2022a, 2022b, 2023; Moliner and Ortí, 2016) to measure teaching difficulties, mainly in novice teachers. In most of them, a series of difficulties have been detected that are frequently repeated: bureaucratic work overload, behavioral management in the classroom, the number of students in class or student motivation. Research carried out with future teachers confirmed that the greatest difficulties for future teachers focused on relationships with families, the teaching style for classroom management, conflict resolution and the use of teaching time. There was also concern about the possible rejection of methodological innovation (Sanz et al., 2022a; Sanz et al., 2022b; Sanz et al., 2023).

Faced with these difficulties, the latest barometer of the *Fundación SM* and the *Observatorio de la Escuela en Iberoamérica* (Fundación SM, 2023), on Teachers in Spain 2023, states that 47% of teachers remain somewhat indifferent and/or distanced from their profession, and do not rule out the possibility of leaving teaching if a new job opportunity arises. This percentage has multiplied by 3 in the last fifteen years. This multi-causal reality is justified, among other things, in the report itself in the following terms: "The enthusiasm and interest aroused by the new is often accompanied by anguish and bewilderment. Moreover, in the face of the complexities that the teaching task presents, feelings of fear and insecurity increase" (Fundación SM, 2023, p. 6). This is why 33% of teachers have experienced apathy, 37% exhaustion and 39% anxiety or depression in relation to their teaching task. Most of these situations are related to teaching difficulties such as management and organization of teaching and personal and pedagogical relationships with students and fellow teachers. Therefore, to reduce the parameters of apathy, burnout and anxiety or depression, it is important to identify the difficulties in teaching and to be able to work on them, providing future teachers with tools.

In this sense, the adaptation of this new questionnaire facilitates the handling of the instrument, making it shorter and, therefore, faster to complete, making the diagnosis simpler and more reliable (Morales et al., 2003). This reduction in the number of items and response time also benefits the possible complementarity of this questionnaire with other questionnaires that can measure other factors of interest not initially considered. In addition, those items that discriminate less or do not provide any new or relevant information were eliminated and the questionnaire becomes more sensitive to the differences between Teacher Degree and the Master's Degree in Teacher Training.

This adaptation for students, regarding the perception of difficulties they may experience in their future, can be used to inform training programs or curriculum design to alleviate potential factors that hinder future teacher's confidence such as anxiety, concern and fears. In addition, it is also possible to take advantage of internship periods to recognize whether these difficulties really correspond to the reality of the classroom and of education or whether they are simply misconceptions about teaching. For this reason, we believe that this is a privileged moment to analyze perceptions about problems in teaching.

Once the Exploratory Factor Analysis was carried out, the questionnaire items were reduced and grouped into 5 dimensions. These new dimensions respond to the meaning of the items and the description of teaching competencies collected in scientific literature. In this way, the new classification would be: a) Difficulties related to teaching content; b) Difficulties related to pedagogical organization; c) Difficulties related to relationships with families; d) Difficulties related to relationships with the center and colleagues; and e) Difficulties related to personal organization (Table 7).

Table 8
List of factors and items of the new Questionnaire

Difficulties regarding teaching content	Difficulties related to pedagogical organization	Difficulties in relations with families	Difficulties regarding relationships with the center and peers.	Difficulties related to personal organization
<i>*Motivate students in their schoolwork.</i>	Scheduling a lesson for one day	Finding parents indifferent	Feeling poorly integrated professionally in school and among classmates	Finding time to prepare materials
Know what students already know	Organizing the daily work of the class	Encountering resistance or skepticism from parents when trying new teaching methods	Professional disagreements with peers	Finding time to read professional books and journals
Know at what level to present the content	Use of teaching aids (slides, videos, newspapers, computers...)	Disagreements in relations with parents	Having insufficient information on how to locate teaching materials	Finding time to spend with family and friends
Knowing what content to emphasize or break down further	Making personal contact with the students		Having insufficient information about school rules and routines	Keeping my private life separate from the school
	<i>*Discipline problems with students/groups of students</i>		Arousing skepticism or resistance from peers or principal when attempting to develop new teaching methods	
	Cooperating with peers		Disagreements in relations with the school principal	
	Having the opportunity/time to talk to peers			

*Items 3 and 29 have been added to the questionnaire, despite having been discarded by the factor analysis, since the scientific literature identifies them as important difficulties among teachers.

a) Difficulties related to teaching content. Teaching content refers to what students should learn, both in conceptual and procedural and attitudinal aspects. To achieve meaningful learning, it is necessary to start from what students already know, i.e., from previous knowledge. It is also necessary to adapt these contents to the level of the students, considering their Zone of Proximal Development, the one in which they can learn on their own or with the help of a classmate or the teacher. In research with novice teachers, Cañón (2012) observes that almost half of novice teachers (45%) have problems in determining the teaching level of the content. Finally, content should also be prioritized, emphasizing those that represent "useful" learning for life. Along these lines, there is also research that highlights the difficulties that teachers have in motivating their students and that lead to the appearance of burnout (Vera y Gabari, 2019).

b) Difficulties related to pedagogical organization. The pedagogical organization brings together the tasks that every teacher must perform in relation to teaching. From

programming and organizing learning to interacting with students and teachers. This dimension coincides with multiple classifications of professional competencies, such as, for example, that of Perrenoud (2004). Regarding the proposed activities, some studies (Sánchez-Barbero et al., 2019) show that the most experienced teachers make pedagogical proposals that make students reason more and that they can analyze school reality more realistically. Thus, it is important to know the difficulty in scheduling and organizing work daily. Another study (Rubio & Olivo, 2020) analyzes the evolution of these teachers' difficulties over the years, highlighting factors such as: classroom discipline management (Valle et al., 2022), bureaucratic work overload and the number of students. These authors propose the attitudinal and emotional assessment of students to overcome the difficulties of novice teachers. Another difficulty is the management of heterogeneous groups and attention to diversity (Cisternas & Lobos, 2019). Along these lines, Shuukwanyama (2023) recommends the implementation of training in the use of effective coping mechanisms for novice teachers to alleviate these difficulties.

c) Difficulties regarding relations with families. In addition to the educational process, teachers manage a series of personal and professional relationships with the students' legal guardians. They have the obligation to inform the families of the evolution and personal and academic development of the students, as well as of the methodology used to achieve the proposed objectives. This relationship with families generates tensions, which, as stated by Moliner and Ortí (2016), Orozco (2016), Cañón et al. (2017) and Fernández (2017), worry teachers. On many occasions, teachers themselves state that they do not know how to manage this relationship.

d) Difficulties regarding relationships with the center and peers. The educational center is a micro-society where personal and professional relationships are generated. This duality causes conflicts of a professional nature to derive, on occasions, in problems of a personal nature. This difficulty is detected in the studies of Sanz et al. (2022, 2023) who stated that teachers feel alone when implementing innovations and fear certain opposition or rejection. Teachers perceive a lack of teamwork among faculty and difficulties in generating collaborative cultures (Solís et al., 2016; Cañón et al., 2017). (Solís et al., 2016; Cañón et al., 2017). Along these lines, Rubio & Olivo (2020) also claimed there is a certain isolation of the teaching staff, which leads to a confusing and insufficient flow of work information.

e) Difficulties related to personal organization. Personal organization is associated with the need to have time to get information and prepare materials. It is also linked to the supposed difficulty of knowing how to manage this time, dissociating work and personal life moments. Teachers say that work demands a lot of effort and takes away from their private time. This aspect was already denounced decades ago by Jordel (1985) as a factor that distressed new teachers. Nowadays, this anxiety is once again highlighted (Montero y Gewerc, 2019; Rubio & Olivo, 2020). These perceptions and feelings lead to a decrease in educational quality and a feeling of professional dissatisfaction.

The five factors analyzed respond to the tasks that, according to Marcelo (2009) a novice teacher must perform: acquire knowledge about students, the curriculum and the school context; design appropriate curriculum and instruction; develop a teaching

repertoire; create a learning community in the classroom; and develop a professional identity.

CONCLUSION

As a conclusion, the consistency of the instrument to evaluate the teaching difficulties of students of different degrees and postgraduates of education is highlighted. This new instrument substantially improves its validity, reliability, and sensitivity. Having demonstrated the importance of studying the problems of novice teachers, this instrument broadens its usefulness and scope by evaluating students. Working on the teaching difficulties that prospective teachers foresee and analyzing them during the pre-service training process will improve the training of future teachers. In addition, the new composition of the dimensions is adapted to the competencies or tasks of teachers, responding to the scientific literature. Therefore, it allows analyzing these difficulties in terms of the competencies and/or tasks required for the teaching profession.

Regarding limitations and future lines, it should be noted that, after the elimination of 33 items from the original version of the scale, the presence of 2 relevant items is missing at a theoretical level. These items have high scores in all the research carried out on teacher teaching difficulties. For this reason, we think that for future research it would be convenient to add them to the reduced version of 22 items. Thus, future studies could use the reduced version plus these 2 items (Motivating students in school tasks and Discipline problems with students/groups of students) and contrast their fit in future studies with the tool and analyze through factor analysis their loading in the factors to which they theoretically belong.

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