



Trainers' Perceptions of Initial Physical Education Teacher Training within Moroccan CRMEFs: Preliminary Development and Exploratory Validation of an Evaluation Grid

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Abstract

Objectives. This study aimed to examine teacher trainers' perceptions of initial Physical Education and Sport teacher training within Moroccan Regional Centers for Education and Training Professions and to provide preliminary evidence of the exploratory validity and internal consistency of a multidimensional evaluation grid.

Materials and Methods. A quantitative cross-sectional design was adopted. The sample included 125 Physical Education and Sport teacher trainers from five Moroccan CRMEFs. An initial pool of 38 items was developed based on institutional standards, the expected graduate profile, and the literature on teacher education and professionalization. After expert review, the instrument was reduced to 30 items. Principal component analysis with Varimax rotation was used as an exploratory procedure to examine the internal structure of the grid, while Cronbach's alpha was calculated to assess its internal consistency.

Results. The exploratory analysis suggested a four-factor structure corresponding to the theoretical dimensions of the instrument: training program organization, pedagogical training practices, supervision and pedagogical support, and internship–CRMEF field articulation. After item purification, the final version included 26 items. Internal consistency was acceptable across all four dimensions. The final 26-item version showed acceptable preliminary psychometric indicators, particularly regarding its exploratory factorial structure and internal consistency. Descriptive results showed moderate perceived levels across all dimensions, with relatively higher scores for training organization and pedagogical support and lower scores for internship and CRMEF–field articulation. ANOVA results indicated no statistically significant differences between CRMEFs, with very small effect sizes.

Conclusion. The findings suggest relatively homogeneous perceptions among teacher trainers across the participating CRMEFs. However, the study does not assess the objective effectiveness of teacher training or professional outcomes. Rather, it provides preliminary exploratory evidence for an evaluation grid and highlights perceived weaknesses in the articulation between institutional training and field-based internship. Further studies using larger samples, confirmatory factor analysis, and multi-stakeholder data are needed.

Keywords: initial training, PES trainee teachers, construct validity, reliability, professional practices.

Introduction

Physical Education (PE), as a compulsory subject across most schools at both primary and secondary levels, has recently gained increased importance (Syaukani, et al., 2023). Initial teacher education is now recognized as one of the major levers for reforming educational systems,

identified as a cornerstone of the new social contract for education (UNESCO, 2021; OECD, 2020). It is crucial not only for the acquisition of foundational competencies but, more importantly, for preparing future teachers to cope with the complexity of the profession. In this regard, internships and practicum experiences play a central role: they allow trainee teachers to develop a reflective and critical stance, contributing to the shaping of their professional identity. In Physical Education, such training provides them with the scientific and pedagogical knowledge essential for their teaching career (Almonacid-Fierro et al., 2021). Research

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consistently emphasizes that professionalization cannot be reduced to the mere accumulation of theoretical knowledge; rather, it results from a dynamic process of situated learning and continuous regulation between theory and practice (Lave & Wenger, 1991; Korthagen & Kessels, 1999). According to Darling-Hammond (2017), the objective is to develop effective practices capable of addressing the real challenges of the classroom.

In this context, Physical Education and Sports (PES) occupies a distinctive position. As an action-centered discipline, it confronts novice teachers with the need to master “core practices” within a dynamic and often unpredictable environment (McDonald et al., 2013). Teachers must simultaneously manage motor learning, safety issues, student heterogeneity, and frequently significant material constraints. The quality of pedagogical intervention therefore depends critically on the training program’s ability to integrate academic knowledge with field-based demands—a coherence that is often difficult to achieve (Hammerness, 2006). In Morocco, the training provided by the Regional Centers for Education and Training Professions (CRMEF) aims to foster this professionalization process. However, a gap persists between the intentions of the curriculum and the reality of practicum experiences. This discrepancy is even more critical in Physical Education (PE), where material and institutional conditions may hinder the transfer of acquired knowledge and skills into practice.

The mismatch between institutional prescriptions and classroom realities is not without consequences. For trainee teachers, the impact is immediate and often burdensome. From the very first weeks of training, they face a mental workload that goes beyond purely academic demands. In Morocco, research confirms this sense of distress: future teachers exhibit concerning levels of stress and burnout well before their official appointment (Bouhaba et al., 2021, 2022). In practice, this translates into a persistent feeling of inadequacy—the impression of never fully meeting expectations, the difficulty of balancing coursework at the CRMEF with the urgency of classroom demands, and the feeling of being evaluated without having the real means to adjust. Of course, this experience is not uniform. As analyzed by Bouhaba et al. (2022), certain personal or organizational factors may exacerbate the situation, particularly when support lacks structure. In PE, where everything is visible—safety management, group control, performance—the ambiguity that sometimes surrounds the roles of each actor (trainer, mentor, trainee) can further fuel anxiety. Ignoring these perceptions would be a mistake. According to Abdelmounaim et al. (2022), taking trainee teachers’ lived experiences into account is an essential step toward understanding the roots of these tensions and preventing them from becoming an accepted norm within teacher education.

Despite the recognized importance of initial teacher education, a gap persists between training objectives and actual teaching practices (Korthagen & Kessels, 1999; Darling-Hammond, 2017). This misalignment reflects both difficulties in translating competencies into practice and a lack of validated tools to rigorously assess training processes. Evaluating initial teacher education cannot be reduced to a simple counting of instructional hours or a verification of theoretical curricula. The issue is far more concrete:

does the program genuinely equip future teachers to face the realities of the profession? Unfortunately, the Moroccan context suffers from a methodological gap in this regard, particularly in Physical Education (PE). In the absence of more suitable tools, generic evaluation grids are often used, which fail to capture the specific nature of motor activities or the subtleties of modern mentoring practices (Ben-Amram & Davidovitch, 2024). Yet, the scientific requirement is clear: to be meaningful, any evaluation instrument must first demonstrate its reliability and content validity (Carmines & Zeller, 1979; Fabrigar et al., 1999).

This challenge, however, is not insurmountable. Recent research conducted with Moroccan teachers has shown that it is entirely possible to design measurement instruments that are both robust and culturally appropriate (Abdelmounaim et al., 2022). Achieving this requires grounding the process in real-world practice by giving voice not only to teacher educators but also to mentor teachers—key field actors whose crucial role too often remains unclear (Baco et al., 2023). This study focuses specifically on teacher trainers’ perceptions of initial Physical Education and Sport (PES) teacher training within CRMEF institutions in Morocco, using a multidimensional evaluation grid developed for exploratory purposes. This approach is not intended to measure the objective effectiveness of training, but rather to provide training stakeholders with an initial, structured, and contextually relevant tool for identifying perceived strengths and areas for improvement.

Education plays a fundamental role in the development of societies and constitutes a key lever for national progress (Poonsri, 2008). It represents a structured process of acquiring and transmitting knowledge, skills, and values through teaching, training, and research (Arifin, 2017). Universally recognized as the cornerstone of progress and social development, education relies largely on the commitment and quality of the teaching workforce, whose role is decisive in fulfilling this essential mission (Oulaydi et al., 2024). The quality of teaching depends to a great extent on the various forms of teachers’ knowledge, including specific subject-matter knowledge, pedagogical content knowledge, and psycho-pedagogical knowledge, all considered essential for effective educational practice (Kunter et al., 2013; Oulaydi et al., 2025). In this regard, the quality of the educational system largely depends on the quality of teacher education, as teachers are central actors in the educational process. Furthermore, preparing pre-service teachers to adapt to educational systems during their training programs can help them cope more effectively with the challenges they may face during the early years of their careers (Filiz & Durnali, 2019).

Physical Education (PE), as an integral component of the educational system, contributes to students’ overall development—physically and motorically, as well as cognitively, affectively, and socially (Kelmendi & Dedi, 2024). It also promotes the development of critical thinking, reasoning, and social skills through engagement in physical activities (Kelmendi & Dedi, 2024). Therefore, the training of PE teachers is of particular importance, given the specific knowledge and competencies mobilized within this discipline. In this context, classroom management represents a significant challenge for Physical Education teachers. Physical education teachers, like all educators, are

frequently confronted with students' problematic behaviors. However, many of them report difficulties in creating a learning environment that not only supports effective learning but also promotes cooperation and self-regulation among students (Buchanan & Hinton, 2018).

The teaching profession requires the mobilization of multiple resources—cognitive, affective, and motor—to cope with complex and diverse pedagogical situations (Zahir, 2019). However, students entering initial teacher education programs bring with them pre-existing beliefs about the profession, constructed throughout their academic and social trajectories (Tsangaridou, 2006). These representations influence their approaches to teaching and must therefore be taken into account in teacher education programs. The work of Rayou and Ria (2009) highlights that entry into the teaching profession requires training grounded in authentic, field-based situations. According to these authors, professional learning relies on the trainee's ability to analyze and manage critical situations by developing contextualized responses. They also emphasize the importance of dialogic support that fosters the verbalization of action and reflective practice. Thus, alternation should not be conceived as a simple juxtaposition of theory and practice, but rather as a dynamic process of reflective articulation between the two training environments (Rayou & Ria, 2009). From this perspective, training programs that incorporate field placements constitute a central component of educational systems. In Morocco, trainee teachers engage in various practical activities within schools. However, some studies point out that the contribution of host institutions to trainees' professional development sometimes remains limited, raising questions about the coherence of the training-field articulation (Bouabdallah, 2021).

In Morocco, teacher education is provided by the Regional Centers for Education and Training Professions (CRMEF). Candidates admitted through a competitive examination receive qualifying, professionally oriented training focused on the practice of teaching through real-life professional situations in schools (high schools, middle schools, and primary schools) (Zahir, 2019). This training is based on the "Practice–Theory–Practice" paradigm, organized through a modular system and centered on the competency-based approach and educational research. The perceived quality of initial teacher education is an important indicator for understanding how teacher training systems are evaluated by training actors and how they may support trainee teachers' professional preparation. Furthermore, the evolving role of the teacher in guiding teaching and learning processes, with an emphasis on placing the learner at the center, requires the implementation of contemporary teaching methods and strategies that align with the rapid transformations in the educational system (El Qryefy et al., 2024b).

More specifically, the training of Physical Education (PE) teachers within the CRMEF is structured around four complementary modules: planning of learning, management of learning, assessment of learning, and an additional module focusing on the technical, tactical, and regulatory aspects of physical and sports activities (Zahir, 2019). Together, these components aim at the progressive development of the professional competencies required for effective teaching practice. In this context, examining the

perceived quality of initial teacher training emerges as a central issue. Examining the alignment between training objectives, support mechanisms, and the practices actually implemented makes it possible to evaluate the level of professionalization achieved and to identify areas for improving the initial teacher education system in Physical Education (PE) in Morocco. To our knowledge, there is currently no specific tool designed to systematically and structurally examine teacher trainers' perceptions of the quality of initial training of Physical Education and Sport (PES) trainee teachers within the CRMEF in Morocco. From this perspective, the present study is of particular importance, as it aims to develop and explore the validity of an evaluation grid for examining the perceived quality of this training from the perspective of teacher trainers. This grid is structured around four complementary dimensions: the organization of the training program, pedagogical training practices, supervision and pedagogical support, and the articulation between the CRMEF and the field internship.

The objectives of this study are to examine teacher trainers' perceptions of initial Physical Education and Sport (PES) teacher training across different CRMEFs using a structured evaluation grid. First, the study aims to explore the construct structure of the instrument through exploratory factor analysis (EFA). It also seeks to assess the internal consistency of the instrument and to examine the relevance and clarity of its items in relation to the theoretical framework of initial teacher education. Finally, the study aims to investigate inter- and intra-CRMEF differences in teacher trainers' perceptions of training across the four dimensions of the evaluation grid.

Materials and Methods

This research adopts a quantitative cross-sectional approach aimed at examining teacher trainers' perceptions of initial Physical Education and Sport (PES) teacher training. First, a preliminary study was conducted to develop and explore the psychometric properties of an evaluation grid for this training program. This study is based on exploratory factor analysis and reliability assessment, with the aim of examining the preliminary structural coherence and internal consistency of the proposed instrument.

It is important to note that the present study does not assess the objective effectiveness of initial teacher training or the actual professional performance of trainee teachers. The data reflect teacher trainers' perceptions of the organization, pedagogical practices, supervision, and internship articulation within the training system. Therefore, the findings should be interpreted as perceived indicators of training quality rather than direct evidence of professional training effectiveness.

Measurement Instrument

Initial Development of the Evaluation Grid

This tool aims to examine, in a comprehensive and multidimensional way, teacher trainers' perceptions of initial teacher education, particularly in Physical Education and Sport (PES), within the CRMEF. The instrument allows for the examination of teacher trainers' perceptions regarding:

- The organization and coherence of the training system in terms of structure, planning, and alignment with institutional standards.
- The pedagogical practices of the training, including teaching methods, proposed learning situations, and the use of pedagogical and digital tools.
- The supervision and mentoring of trainees, including monitoring, feedback, and support for professional development.
- The articulation between training at the CRMEF and field-based practicum, as well as coordination with host institutions.

The development of the grid began with an initial pool of 38 items, designed based on:

- Institutional standards for initial PE teacher training at the CRMEF,
- The expected graduate profile of trainee teachers, and
- A review of the scientific literature on initial teacher education, teacher professionalization, and evaluation of training programs (Darling-Hammond, 2017; Zeichner, 2016).

Content Validation of the Grid

The content validity of the initial version of the evaluation grid was examined using a panel of six experts, composed of CRMEF teacher educators, Physical Education (PE) inspectors, and university researchers specialized in teacher education. This approach follows established methodological recommendations for content validation in the development of measurement instruments in educational sciences (Lynn, 1986; Boateng et al., 2018). Each expert was asked to evaluate the items according to several criteria, including relevance, clarity of wording, and representativeness with respect to the targeted theoretical dimensions. Feedback from the experts allowed the identification of items with redundancies, conceptual ambiguities, or insufficient operational precision. At the end of this expert review, 8 items were removed, resulting in a revised version of the grid comprising 30 items. Furthermore, some formulations were reworded and adjusted to improve readability, internal coherence, and overall clarity of the instrument. The item reduction process leading to the final version of the grid is presented in Table 1.

Participants

The study was conducted with 125 Physical Education and Sport (PES) teacher educators working in five Regional Centers for Education and Training Professions (CRMEF) in Morocco. These educators were selected due to their proven experience in supervising trainee teachers and their direct involvement in initial teacher education. During the teaching practicum, they observed the pedagogical practices of trainee teachers in real classroom settings. Their contribution helped enrich the analysis of teaching practices in initial teacher education, taking into account institutional requirements as well as the realities of school contexts. The sample consisted of 45 women and 80 men, with a mean age of 43.52 years ($SD = 1.09$; $min = 27$; $max = 62$).

Data Collection Procedure

The revised 30-item version of the observation grid was administered to teacher trainers using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Participants had prior knowledge of the study and took part voluntarily. The main objective of this data collection phase was to assess the feasibility of the instrument, verify the clarity and comprehensibility of the items, and produce descriptive and inferential results in order to examine teacher trainers' perceptions of initial Physical Education and Sport (PES) teacher training within the CRMEFs. After the exploratory factor analysis and item purification process, the final retained version of the grid consisted of 26 items.

Statistical Analyses

Data were entered, coded, and analyzed using SPSS software, version 26. The reliability of the scale was assessed using Cronbach's alpha coefficient to examine the internal consistency of the items and their homogeneity within each dimension of the grid. The factorial structure of the grid was examined through exploratory factor analysis (EFA) in order to explore its internal structure and assess the appropriateness of item grouping within the underlying factors. Descriptive analyses, including means and standard deviations, were conducted to describe teacher trainers' perceptions across the evaluated dimensions. In addition,

Table 1. Item Reduction Process (Instrument Development)

Process Step	Objective	Method	Number of Items
Initial item pool development	Cover all theoretical dimensions of initial PE teacher education	Analysis of institutional standards, literature review, authors' expertise	38
Evaluation of item relevance	Verify the alignment of items with the targeted dimensions	Expert judgment (relevance, clarity, representativeness)	38
Removal of redundant or imprecise items	Improve conceptual coherence and readability of the grid	Qualitative analysis of expert feedback	8 removed
Item adjustment and rewording	Strengthen the operational precision of retained items	Linguistic and conceptual revision	30
Revised version administered to participants	Obtain a coherent instrument for empirical testing	Research team consensus after expert review	30
Final retained version after PCA purification	Retain items with acceptable factorial structure	Removal of items with low loadings or cross-loadings	26

a one-way analysis of variance (ANOVA) was performed to examine differences in perceived training quality across the five CRMEFs included in the study.

Results

In this section of the results, the findings related first to construct validity and the reliability of the evaluation grid are presented, in order to examine its psychometric properties. In addition, descriptive and inferential statistical analyses were conducted to examine teacher trainers' perceptions of initial Physical Education and Sport (PES) teacher training across the different dimensions of the grid.

Results of the Validation of the Evaluation Grid

Exploratory Factor Analysis

An exploratory factor analysis (EFA) was conducted to examine the initial structural coherence of the evaluation grid. First, the data adequacy indices for factor analysis were verified. The corresponding results are presented in Table 2.

Table 2. Data Adequacy Indices for Factor Analysis

Index	Value
KMO Index	0.69
Bartlett's Test (χ^2 , p)	$\chi^2=879.463$, $p < 0.001$

The results presented in Table 2 show that the Kaiser-Meyer-Olkin (KMO) coefficient is above 0.60, a threshold considered acceptable according to the recommendations of Cohen et al. (2013). This value indicates that the sample size is adequate for conducting a factor analysis. Furthermore, Bartlett's test of sphericity (χ^2) is statistically significant ($p < 0.001$), allowing us to reject the null hypothesis that the correlation matrix is an identity matrix (El Qryefy et al., 2024a). Taken together, these results confirm the appropriateness and feasibility of the data for performing an exploratory factor analysis.

A principal component analysis (PCA) with Varimax orthogonal rotation was conducted to examine the internal structure of the evaluation grid. Factor selection was based on the Kaiser criterion, retaining components with eigenvalues greater than 1. According to the criteria established by Hair et al. (2010), a factor loading above 0.50 for each item is considered significant and validates the relevance of the questionnaire. Items with factor loadings equal to or greater than 0.50 were therefore deemed acceptable and retained. Conversely, items with factor loadings below 0.30 were automatically removed by SPSS due to their low contribution to the identified factors.

Table 3. Variance Explained by the Extracted Factors

Factors	Explained Variance (%)
Factor 1	26.8
Factor 2	18.5
Factor 3	12.1
Factor 4	9.3
Cumulative Variance	66.7

The results presented in Table 3 indicate that the principal component analysis (PCA) extracted four factors, consistent with the number of dimensions initially retained during the construction of the teacher practices evaluation grid. These four factors explain a total cumulative variance of 66.7%, reflecting a satisfactory level of information retention. This percentage is considered acceptable and adequate for this type of factor analysis, in accordance with the methodological recommendations of Gorsuch (2013), who suggests that an explained variance rate above 60% is generally sufficient in research within the social and human sciences.

Table 4. Factors Extracted by Principal Component Analysis (PCA) (N = 125)

Items	Factors			
	F1	F2	F3	F4
Item 24	0.915			
Item 20	0.882			
Item 6	0.819			
Item 11	0.801			
Item 3	0.769			
Item 19	0.754			
Item 27	0.747			
Item 12	0.728			0.311
Item 17		0.863		
Item 30		0.823		
Item 22		0.778		
Item 16		0.735	0.350	
Item 4		0.718		
Item 9		0.698		
Item 14		0.636		
Item 18			0.843	
Item 25			0.791	
Item 5			0.772	
Item 13			0.731	
Item 15		0.437	0.633	
Item 21			0.598	0.410
Item 8			0.524	
Item 2		0.367	0.461	
Item 10				0.782
Item 28				0.759
Item 7				0.721
Item 23				0.638
Item 1				0.573
Item 26				0.546
Item 29	0.346			0.489

The results presented in Table 4 show that the majority of items exhibit high factor loadings on their theoretically expected factor, confirming the coherence of the factorial structure of the evaluation grid. However, items 12 and 15

showed high loadings (> 0.50) on factors other than those theoretically expected, suggesting a mismatch between the observed results and the factor to which they were theoretically associated. Furthermore, items 2 and 29 showed factor loadings below the threshold of 0.50, indicating an insufficient contribution to the dimensions to which they were associated. Following the recommendations of Hair et al. (2010), these four items were removed in order to improve the stability and theoretical coherence of the factorial structure. Their removal within the grid purification process also contributed to strengthening the overall psychometric properties of the instrument.

Following this purification procedure via principal component analysis (PCA), the final version of the scale consists of 26 items, coherently distributed across the retained dimensions:

- Factor 1: Organization of the program (7 items).
- Factor 2: Pedagogical training practices (7 items).
- Factor 3: Supervision and pedagogical support (6 items).
- Factor 4: Internship and CRMEF-field articulation (6 items).

The final 26-item version showed acceptable preliminary psychometric indicators, particularly regarding exploratory factorial structure and internal consistency. However, this validation should be considered preliminary, as confirmatory factor analysis, test-retest reliability, convergent validity, and discriminant validity were not examined.

Reliability of the Grid

The internal consistency of the grid was assessed using Cronbach's alpha coefficients, calculated for each identified dimension as well as for the entire instrument, which comprises 26 items after the purification phase conducted through PCA. This procedure aims to verify the degree of item homogeneity and their ability to reliably measure the underlying theoretical constructs. The results, presented in Table 5, demonstrate the level of internal reliability for each dimension as well as the overall robustness of the evaluation tool.

Table 5. Reliability of the Evaluation Grid

Dimension	Number of Items	Cronbach's Alpha
Organization of the Training Program	7	0.85
Pedagogical Training Practices	7	0.81
Supervision and Pedagogical Support	6	0.73
Internship and CRMEF-Field Articulation	6	0.76
Overall Grid	26	0.79

Note. CRMEF = Regional Center for Education and Training Professions (Centre Régional des Métiers de l'Éducation et de la Formation)

As shown in the results presented in Table 5, all dimensions of the observation grid, as well as the instrument as a whole, demonstrate satisfactory levels of reliability. The internal consistency coefficients for each dimension exceed the recommended threshold of 0.70 (Nunnally, 1994), indicating good item homogeneity and acceptable reliability of the measurement tool. These results support the internal

consistency of the adopted structure and suggest that the grid may be used as an initial tool for examining teacher trainers' perceptions of initial PES teacher training. However, its use should remain cautious until further psychometric validation is conducted.

Teacher Trainers' Perceptions of Initial PES Teacher Training in Moroccan CRMEFs

Normality of Each Dimension of the Evaluation Grid

The results presented in Table 6 show that teacher trainers' perceptions regarding the different dimensions of the initial teacher training evaluation grid are generally moderate. The dimension "Organization of the Training Program" records the highest mean score ($M = 3.13$; $SD = 0.81$), indicating a relatively positive assessment of the structuring and planning of the initial training program. Similarly, the dimension "Supervision and Pedagogical Support" also obtains a relatively high score ($M = 3.09$; $SD = 0.84$), suggesting that teacher trainers perceived the mentoring and support provided during training relatively positively. In contrast, the dimension "Pedagogical Training Practices" ($M = 2.97$; $SD = 0.81$) and especially "Internship and CRMEF-Field Articulation" ($M = 2.79$; $SD = 0.71$) show the lowest mean scores. These results reveal perceived shortcomings, particularly regarding training practices and the coordination between theoretical training within the CRMEF and field-based experiences. These aspects therefore represent priority areas for institutional improvement, particularly in strengthening the perceived coherence between initial training and field-based professional preparation.

Regarding data distribution, it can be considered normal when skewness and kurtosis values remain between -2 and +2, according to the recommendations of Kline (2023). The skewness coefficients range from -0.345 to -0.580, while the kurtosis coefficients range from -0.289 to -0.701. These values indicate that the distributions of the different dimensions of the scale are normal. Thus, based on these methodological recommendations, the results obtained in this study meet the conditions of approximate normality, which statistically justifies the use of parametric tests for subsequent inferential analyses.

Table 6. Overall Means and Normality Assessment of the Dimensions of the Evaluation Grid

Dimensions	Mean	SD	Skewness	Kurtosis
Organization of the Training Program	3.1291	0.81772	-0.345	-0.289
Pedagogical Training Practices	2.9742	0.80856	-0.343	-0.701
Supervision and Pedagogical Support	3.0920	0.84387	-0.580	-0.497
Internship and CRMEF-Field Articulation	2.7968	0.71791	-0.352	-0.579

Descriptive Analysis Results of the Mean Scores of the Dimensions of the Grid across the Five CRMEFs

Table 7 presents the descriptive statistics of the four dimensions of the evaluation grid of the initial training of Physical Education and Sports (PES) trainee teachers, as assessed by teacher trainers working in five Regional Centers

for Education and Training Professions (CRMEF) in Morocco. The results show that teacher trainers' perceptions of initial training are generally moderate across all the CRMEFs studied, with relatively limited differences between centers. Regarding the dimension "Organization of the Training Program," the means range from 2.90 to 3.33. CRMEF3 records the highest mean score ($M = 3.33$; $SD = 0.67$), reflecting a relatively positive perception of the organization and structuring of the training program. In contrast, CRMEF4 shows the lowest mean score ($M = 2.90$; $SD = 0.86$), indicating a more reserved perception of this dimension among teacher trainers. For the dimension "Pedagogical Training Practices," the results reveal relatively close mean values across the different centers, ranging from 2.89 to 3.13. CRMEF5 obtains the highest mean ($M = 3.13$; $SD = 0.80$), while CRMEF2 shows the lowest mean ($M = 2.89$; $SD = 0.85$). This similarity in scores suggests that pedagogical practices implemented across the CRMEFs are perceived in a relatively homogeneous way by teacher trainers.

Regarding the dimension "Supervision and Pedagogical Support," the observed means range from 2.98 to 3.24. CRMEF5 shows the highest mean score ($M = 3.24$; $SD = 0.88$), indicating a more positive perception of pedagogical support and mentoring provided during initial training. In contrast, CRMEF1 records the lowest mean ($M = 2.98$; $SD = 0.80$). Finally, the dimension "Internship and CRMEF-Field Articulation" records the lowest scores among all four dimensions, with means ranging from 2.74 to 2.91. CRMEF5 shows the highest mean ($M = 2.91$; $SD = 0.65$), while CRMEF2 presents the lowest ($M = 2.74$; $SD = 0.65$).

Overall, the relatively similar standard deviations indicate a moderate dispersion of responses among teacher trainers across the different centers. The 95% confidence intervals also indicate acceptable stability of the estimated means. In general, the dimensions related to program organization and pedagogical support show relatively higher mean scores compared to the "Internship and CRMEF-Field Articulation" dimension, which records the lowest scores across the CRMEFs.

Analysis of Inter- and Intra-CRMEF Differences in Perceived Initial Training Quality of Physical Education and Sport Teachers

Levene's test (Table 8) was conducted to verify the assumption of homogeneity of variances prior to performing the one-way analysis of variance (ANOVA). This condition represents one of the key statistical assumptions required for the application of parametric comparative tests (Field, 2018). The results show that the significance values associated with Levene's test are above the critical threshold of 0.05 for all studied dimensions: "Organization of the Training Program" ($p = 0.465$), "Pedagogical Training Practices" ($p = 0.887$), "Supervision and Pedagogical Support" ($p = 0.930$), and "Internship and CRMEF-Field Articulation" ($p = 0.262$).

These findings indicate that there are no statistically significant differences between the variances of the groups corresponding to the different Moroccan CRMEFs. Consequently, the assumption of homoscedasticity is

Table 7. Descriptive Statistics of the Evaluation Grid Dimensions across the Five CRMEFs

Dimensions	CRMEF	N	Mean	Standard Deviation	Standard Error	95% CI (Lower Bound)	95% CI (Upper Bound)
Organization of the Training Program	CRMEF1	27	3.0370	0.82408	0.15859	2.7110	3.3630
	CRMEF2	21	3.1293	0.88399	0.19290	2.7269	3.5316
	CRMEF3	30	3.3333	0.67146	0.12259	3.0826	3.5841
	CRMEF4	27	2.9048	0.86080	0.16566	2.5642	3.2453
	CRMEF5	20	3.2500	0.86323	0.19302	2.8460	3.6540
Pedagogical Training Practices	CRMEF1	27	2.9365	0.83142	0.16001	2.6076	3.2654
	CRMEF2	21	2.8980	0.85731	0.18708	2.5077	3.2882
	CRMEF3	30	2.9924	0.74528	0.13607	2.7141	3.2707
	CRMEF4	27	2.9365	0.85928	0.16537	2.5966	3.2764
	CRMEF5	20	3.1286	0.80799	0.18067	2.7504	3.5067
Supervision and Pedagogical Support	CRMEF1	27	2.9877	0.80454	0.15483	2.6694	3.3059
	CRMEF2	21	3.1508	0.88961	0.19413	2.7458	3.5557
	CRMEF3	30	3.0444	0.86318	0.15759	2.7221	3.3668
	CRMEF4	27	3.0926	0.83760	0.16120	2.7613	3.4239
	CRMEF5	20	3.2417	0.88601	0.19812	2.8270	3.6563
Internship and CRMEF-Field Articulation	CRMEF1	27	2.8148	0.81954	0.15772	2.4906	3.1390
	CRMEF2	21	2.7381	0.65738	0.14345	2.4389	3.0373
	CRMEF3	30	2.7756	0.67250	0.12278	2.5244	3.0267
	CRMEF4	27	2.7654	0.79024	0.15208	2.4528	3.0780
	CRMEF5	20	2.9083	0.65220	0.14584	2.6031	3.2136

Note. CRMEF = Regional Center for Education and Training Professions

satisfied for all four dimensions of the evaluation grid. Furthermore, the low values of the Levene statistic reflect a relative homogeneity in the dispersion of responses provided by teacher trainers across the different centers. This statistical homogeneity strengthens the reliability of subsequent comparisons performed using ANOVA. Thus, the methodological conditions required for conducting one-way analysis of variance are met, allowing the ANOVA results to be interpreted under appropriate statistical conditions.

Table 8. Levene's Test of Homogeneity of Variances for the Dimensions of Evaluation Grid

Dimensions	Levene Statistic	df1	df2	Significance
Organization of the Training Program	0.903	4	120	0.465
Pedagogical Training Practices	0.285	4	120	0.887
Supervision and Pedagogical Support	0.215	4	120	0.930
Internship and CRMEF-Field Articulation	1.331	4	120	0.262

Table 9 presents the results of a one-way analysis of variance (ANOVA) conducted to examine the existence of possible statistically significant differences between the different Moroccan CRMEFs regarding the dimensions of the evaluation grid of the initial training of Physical Education and Sports (PES) trainee teachers. In addition to the statistical analysis, effect size coefficients (η^2) were calculated in order to assess the practical significance of the observed differences between groups. The results show that all significance values associated with the different dimensions are higher than the 0.05 threshold. Thus, no statistically significant differences were found between the five CRMEFs for the dimension "Organization of the Training Program" ($F = 1.177$; $p = 0.324$), for "Pedagogical Training Practices" ($F = 0.256$; $p = 0.906$), for "Supervision and Pedagogical Support" ($F = 0.303$; $p = 0.876$), nor for "Internship and CRMEF-Field Articulation" ($F = 0.175$; $p = 0.951$).

The absence of statistically significant differences between CRMEFs should be interpreted cautiously. These

results indicate that teacher trainers' perceptions were relatively similar across the five participating centers, but they do not demonstrate that the objective quality or effectiveness of training is equivalent across all Moroccan CRMEFs. The observed differences between the mean scores of the centers remained small and did not allow for the conclusion that statistically significant differences existed between the studied institutions.

Moreover, the analysis of effect size coefficients (η^2) revealed very small values for all studied dimensions. According to Cohen's (1988) criteria, an η^2 value below 0.01 corresponds to a very small effect, around 0.06 to a medium effect, and above 0.14 to a large effect. The dimension "Organization of the Training Program" presented the highest effect size coefficient ($\eta^2 = 0.038$), although it still indicated a small effect. This means that only 3.8% of the variance observed in this dimension was explained by belonging to different CRMEFs. The other dimensions showed very small effect sizes: "Pedagogical Training Practices" ($\eta^2 = 0.008$), "Supervision and Pedagogical Support" ($\eta^2 = 0.010$), and "Internship and CRMEF-Field Articulation" ($\eta^2 = 0.006$). These results suggest that the effect of the "CRMEF" factor on teacher trainers' perceptions was practically limited.

Furthermore, the low F-values indicate that inter-group variability was lower than intra-group variability. This suggests that individual differences among teacher trainers within the same center may be greater than the overall differences between CRMEFs. Therefore, the findings should be understood as evidence of perceived homogeneity within the present sample, rather than as proof of equivalent training effectiveness across institutions. This relative similarity in perceptions may be partly explained by the existence of common national frameworks, standardized training programs, and similar institutional guidelines governing initial teacher training at the national level.

Discussion

The present study aimed to examine teacher trainers' perceptions of initial Physical Education and Sport (PES) teacher training within Moroccan Regional Centers for Education and Training Professions (CRMEFs), while

Table 9. One-Way ANOVA of the Dimensions of Evaluation Grid

Dimensions	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	η^2
Organization of the Training Program	Between Groups	3.131	4	0.783			
	Within Groups	79.784	120	0.665	1.177	0.324	0.038
	Total	82.915	124	-			
Pedagogical Training Practices	Between Groups	0.685	4	0.171			
	Within Groups	80.382	120	0.670	0.256	0.906	0.008
	Total	81.067	124	-			
Supervision and Pedagogical Support	Between Groups	0.882	4	0.221			
	Within Groups	87.421	120	0.729	0.303	0.876	0.010
	Total	88.303	124	-			
Internship and CRMEF-Field Articulation	Between Groups	0.370	4	0.093			
	Within Groups	63.540	120	0.529	0.175	0.951	0.006
	Total	63.910	124	-			

developing and testing a multidimensional evaluation grid. The study was structured around four dimensions: training program organization, pedagogical training practices, supervision and pedagogical support, and internship-CRMEF field articulation. Importantly, the findings should be interpreted as reflecting teacher trainers' perceptions rather than as objective measures of training effectiveness or trainee teachers' competencies.

From a psychometric perspective, the exploratory analysis suggested a four-factor structure corresponding to the theoretical dimensions initially proposed during the development of the evaluation grid. After item purification, the final version included 26 items distributed across the four retained dimensions. The internal consistency coefficients were acceptable, indicating satisfactory homogeneity of the items within each dimension. These results support the use of the grid as an initial tool for examining teacher trainers' perceptions of PES teacher training, while further validation remains necessary. It is important to emphasize that the present findings provide only preliminary evidence regarding the psychometric properties of the evaluation grid. Although the exploratory factor analysis and internal consistency results are encouraging, they represent an initial stage in the validation process rather than definitive evidence of construct validity. Consequently, the instrument should currently be considered a promising exploratory measure of teacher trainers' perceptions rather than a fully validated assessment tool.

However, the psychometric results should be interpreted with caution. The present study relied on an exploratory approach and did not include confirmatory factor analysis, test-retest reliability, convergent validity, or discriminant validity. Therefore, the instrument cannot yet be considered fully validated. Rather, it should be viewed as an initial evaluation grid requiring further testing with larger and independent samples. Future studies should confirm the factorial structure through confirmatory factor analysis and examine whether the instrument produces stable and valid results across different populations, training contexts, and educational specializations. This cautious interpretation is consistent with methodological recommendations for scale development, which emphasize that exploratory factor analysis and internal consistency represent important but incomplete stages in the validation process (Fabrigar et al., 1999; Worthington & Whittaker, 2006; Boateng et al., 2018).

The descriptive findings showed that teacher trainers' perceptions of initial PES teacher training were generally moderate across the four dimensions. This suggests that teacher trainers generally hold moderately positive perceptions of the training system, while also identifying areas requiring improvement. The dimensions related to training program organization and supervision and pedagogical support obtained relatively higher scores. This may reflect the existence of formal institutional frameworks, centralized training programs, and common pedagogical guidelines within Moroccan CRMEFs. In this sense, the organization of the training program appears to be perceived as relatively structured by teacher trainers. However, this perception should not be confused with evidence of objective institutional performance. It reflects how trainers evaluate the organization and functioning of the training system based on their professional experience.

The relatively positive perception of supervision and pedagogical support may also be explained by the central role played by CRMEF trainers in accompanying trainee teachers during their professional preparation. Supervision, feedback, and pedagogical guidance are essential elements in teacher education because they contribute to the progressive construction of professional competencies. Previous research has emphasized that mentoring and pedagogical support are key mechanisms for helping trainee teachers connect theoretical knowledge with professional practice (Darling-Hammond, 2017; Baco et al., 2023). In PES teacher education, this support is particularly important because trainee teachers must learn to manage complex teaching situations involving motor learning, safety, equipment, space organization, and student heterogeneity.

In contrast, the lowest scores were observed in the dimension related to internship and CRMEF-field articulation. This result represents one of the most important findings of the study. It suggests that the main perceived weakness of initial PES teacher training lies not in the formal structure of the program, but in the connection between institutional training and real school-based practice. This weakness may be explained by several mechanisms. First, the alternation between CRMEF-based training and field-based internships may remain insufficiently integrated, causing theoretical courses, practical training activities, and internship experiences to operate as parallel rather than complementary components of professional preparation. Second, coordination among CRMEF trainers, mentor teachers, inspectors, and host schools may not always be sufficiently structured, which can lead to fragmented or inconsistent feedback for trainee teachers. Finally, the alignment between training content and the realities of school practice may be limited, reducing the perceived coherence of the professionalization process. Similar challenges have been reported in teacher education programs where institutional training and school-based experiences are not fully integrated.

Third, the specific nature of Physical Education may reinforce these difficulties. Unlike some classroom-based subjects, PES teaching requires immediate management of movement, space, safety, group dynamics, equipment, and differentiated motor abilities. Therefore, the transfer of theoretical knowledge into practice is particularly demanding. A trainee teacher may understand pedagogical principles at the CRMEF but still struggle to apply them in real teaching situations where time pressure, student behavior, and material constraints are present. This supports the idea that professionalization cannot be reduced to the acquisition of theoretical knowledge; it requires situated learning, guided practice, reflective feedback, and strong articulation between training institutions and school contexts (Korthagen & Kessels, 1999; Lave & Wenger, 1991).

These findings are consistent with previous studies highlighting the importance of practicum quality and institutional coordination in teacher education. Tamani et al. (2021), for example, identified several dysfunctions in qualifying teacher training within CRMEFs, including insufficient training time, weak communication between training actors, and limited pedagogical support during internship periods. Similarly, Greve et al. (2020) showed that field experience alone does not automatically improve

teaching performance in Physical Education; its impact depends on the quality of supervision, feedback, and reflective support provided during the practicum. Thus, the low scores observed in the internship-CRMEF field articulation dimension should not be interpreted simply as a logistical problem. They reveal a deeper issue related to the coherence of the professionalization process.

The inferential results showed no statistically significant differences between the five CRMEFs across the four dimensions of the evaluation grid. The effect sizes were very small, indicating that institutional affiliation explained only a limited proportion of the variance in teacher trainers' perceptions. These findings suggest a relative homogeneity of perceptions among teacher trainers across the participating CRMEFs. This may be related to the centralized nature of teacher education in Morocco, where CRMEFs operate under common national frameworks, similar institutional regulations, and standardized training orientations.

Nevertheless, this result must be interpreted carefully. The absence of statistically significant differences does not prove that training conditions are objectively equivalent across all CRMEFs. It only indicates that, within the present sample, teacher trainers reported relatively similar perceptions of the evaluated dimensions. Moreover, the small descriptive differences observed between centers may still reflect contextual specificities, such as differences in facilities, local partnerships with internship schools, trainers' professional experience, or practicum supervision procedures. These factors cannot be fully captured through quantitative scores alone and should be explored in future qualitative or mixed-method studies.

The present findings also highlight the need to distinguish clearly between three levels of analysis: institutional organization, perceived training quality, and professionalization outcomes. Institutional organization refers to the formal structure of the training system, including modules, planning, regulations, and training sequences. Perceived training quality refers to how teacher trainers evaluate the functioning of this system based on their experience. Professionalization outcomes refer to the actual competencies, practices, and professional development of trainee teachers. The present study mainly addresses the second level: teacher trainers' perceptions. It does not directly measure trainee teachers' classroom performance, professional competence development, or long-term teaching outcomes. This distinction is important to avoid overinterpreting the findings.

From a practical perspective, the results suggest several areas for improvement. First, the articulation between CRMEF training and field internship should be strengthened through clearer coordination mechanisms between CRMEF trainers, mentor teachers, inspectors, and host institutions. Second, internship supervision should be based on shared criteria, structured observation tools, and regular feedback sessions. Third, PES trainee teachers should be exposed to more authentic professional situations during training, including classroom management, safety management, lesson adaptation, and reflective analysis of teaching practice. Finally, the evaluation of initial teacher training should involve multiple stakeholders, including trainee teachers, mentor teachers, inspectors, and institutional leaders, in order to provide a more comprehensive understanding of the training process.

Despite its contribution, this study has several limitations. First, the sample was limited to 125 PES teacher trainers from five CRMEFs, which restricts the generalizability of the findings to all Moroccan CRMEFs. Second, the study relied exclusively on teacher trainers' perceptions. Although these actors have valuable professional experience, their perceptions do not provide a complete picture of the training process. Third, the study used a quantitative cross-sectional design, which does not allow causal interpretation or longitudinal analysis of professional development. Fourth, the validation process remains exploratory. Although the present study provides initial support for the factorial structure and internal consistency of the evaluation grid, the absence of confirmatory factor analysis (CFA), test-retest reliability, and assessments of convergent and discriminant validity limits the extent to which construct validity and stability can be established. Therefore, the psychometric properties of the instrument should be considered preliminary and require further validation in independent samples. Finally, the study focused only on the PES specialization, which limits comparison with other teacher education fields.

Future research should therefore adopt a more comprehensive approach by including trainee teachers, mentor teachers, inspectors, and institutional administrators. Mixed-method designs combining questionnaires, interviews, classroom observations, and document analysis would allow for a deeper understanding of the mechanisms underlying perceived strengths and weaknesses in initial teacher training. Longitudinal studies would also be useful to examine how perceived training quality relates to the development of professional competencies over time. Such research would help move beyond perceptions and provide stronger evidence regarding the relationship between institutional training, practicum experiences, and trainee teachers' professionalization.

Overall, the present study provides an initial contribution to the evaluation of PES teacher training within Moroccan CRMEFs. It proposes an exploratory evaluation grid and identifies perceived strengths and weaknesses in the training system. The findings suggest that program organization and pedagogical support are perceived relatively positively, whereas the articulation between CRMEF-based training and field internship remains a major area for improvement. Strengthening the connection between institutional training and real professional practice appears essential for improving the professional preparation of future PES teachers in Morocco.

Conclusion

This study examined teacher trainers' perceptions of initial Physical Education and Sport teacher training within five Moroccan CRMEFs and provided preliminary exploratory evidence for a multidimensional evaluation grid. The results suggest that the grid presents an acceptable exploratory factorial structure and satisfactory internal consistency. However, the validation process remains preliminary and should be strengthened in future studies through confirmatory factor analysis, test-retest reliability, and convergent and discriminant validity analyses. Accordingly, the proposed evaluation grid should not yet be regarded as a fully validated instrument. Rather, it constitutes a preliminary assessment framework that provides encouraging initial evidence and offers a foundation for

future psychometric refinement and validation across larger and more diverse samples of teacher education stakeholders.

From a substantive perspective, teacher trainers reported moderate perceptions of training quality, with relatively stronger evaluations of program organization and pedagogical support, and weaker evaluations of internship and CRMEF-field articulation. These findings suggest that the main challenge lies in connecting institutional training with situated professional practice. The absence of significant differences between CRMEFs indicates relatively homogeneous perceptions among trainers, but it should not be interpreted as evidence of equivalent training effectiveness across institutions.

Overall, the study contributes an initial evaluation framework that may support future research and institutional reflection on PES teacher education in Morocco. Nevertheless, further studies involving trainee teachers, mentor teachers, inspectors, and direct observation of professional practices are needed to better understand the relationship between perceived training quality, institutional organization, and professionalization outcomes.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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Ethics Approval

This study did not involve any experimental intervention on humans or animals. The research was based on voluntary questionnaire responses from adult teacher trainers. It was conducted in accordance with the principles of scientific integrity and applicable ethical standards. No sensitive personal data or confidential information were collected. Informed consent was obtained from all participants prior to data collection. Participation was entirely voluntary, and participants were clearly informed about the purpose of the study and their right to withdraw at any time without consequences. Given the non-interventional and anonymous nature of the study, formal ethical committee approval was not required.

Informed Consent

Informed consent was obtained from all participants prior to their inclusion in the study. Participation was voluntary, and participants were informed about the purpose of the research and their right to withdraw at any time without penalty.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable and justified request.

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Сприйняття викладачами початкової підготовки вчителів фізичної культури в марокканських Регіональних центрах професій освіти та підготовки: попереднє розроблення та експлораторна валідація оціночної шкали

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

Реферат. Стаття: 13 с., 9 табл., 43 джерел.

Мета. Метою цього дослідження було вивчити сприйняття викладачами професійної підготовки майбутніх учителів фізичної культури і спорту в Регіональних центрах професій освіти та підготовки Марокко, а також отримати попередні докази експлораторної валідності та внутрішньої узгодженості багатовимірної оціночної шкали.

Матеріали та методи. Було застосовано кількісний поперечний дизайн дослідження. До вибірки увійшли 125 викладачів, які здійснюють підготовку майбутніх учителів фізичної культури і спорту, із п'яти марокканських Регіональних центрів професій освіти та підготовки (CRMEF). Початковий варіант інструмента складався з 38 пунктів, розроблених на основі інституційних стандартів, очікуваного профілю випускника та наукової літератури з підготовки й професіоналізації вчителів. Після експертної оцінки інструмент було скорочено до 30 пунктів. Для експлораторного дослідження внутрішньої структури шкали застосовано аналіз головних компонент із Varimax-обертанням, а для оцінювання внутрішньої узгодженості розраховано коефіцієнт альфа Кронбаха.

Результати. Експлораторний аналіз засвідчив чотирифакторну структуру, що відповідала теоретичним складовим інструмента: організація освітньої програми, практики педагогічної підготовки, супервізії та педагогічний супровід, а також взаємозв'язок між педагогічною практикою та CRMEF. Після очищення інструмента його фінальна версія містила 26 пунктів. Внутрішня узгодженість була прийнятною для всіх чотирьох складових. Остаточна 26-пунктова версія продемонструвала прийнятні попередні психометричні показники, зокрема щодо експлораторної факторної структури та внутрішньої узгодженості. Описові результати показали помірний рівень оцінок за всіма складовими, при цьому відносно вищі значення спостерігалися для організації підготовки та педагогічного супроводу, а нижчі — для взаємозв'язку між педагогічною практикою та CRMEF. Результати дисперсійного аналізу (ANOVA) не виявили статистично значущих відмінностей між CRMEF, а величини ефекту були дуже малими.

Висновки. Отримані результати свідчать про відносно однорідне сприйняття системи підготовки викладачами в усіх досліджених CRMEF. Водночас дослідження не оцінює об'єктивну ефективність підготовки вчителів або їхні професійні результати. Натомість воно надає попередні експлораторні докази придатності запропонованої оціночної шкали та виявляє сприймані слабкі сторони взаємозв'язку між інституційною підготовкою та педагогічною практикою. Подальші дослідження із більшими вибірками, використанням конфірмаційного факторного аналізу та залученням даних від різних груп учасників є необхідними.

Ключові слова: початкова підготовка, майбутні вчителі фізичної культури і спорту, конструктивна валідність, надійність, професійні практики.

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