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Profiling Physical Education Teachers' Pedagogical Behaviours: Teaching-Style Use, Conscious Fitness-Test Ad-ministration and Physical-Activity Motivation. A Pilot Study in Apulia

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Abstract: Despite the well-endorsement of Spectrum of Teaching Styles in teacher-education training, the evidence about implementation and determinants of the Spectrum in Italy is still limited. The present pilot study aims to explore the relationships between self-perceived use of teaching styles with health-oriented fitness testing and motivation towards physical activity. A cross-sectional survey was administered to a convenience sample of 26 PE teachers in Apulia, southern Italy (53.8% women; mean age 42.4 years, SD = 12.9). Participants were asked to fill an online survey comprising three questionnaires: a Spectrum-based inventory, the FITPET and MPAM-R questionnaires. Results highlighted that reciprocal style correlated positively with the FITPET total score (rho = 0.55) and with its educational-approach dimension (p = .030). Learner-autonomy correlated with three MPAM-R dimensions—competence (p = .005), interest/enjoyment (p = .036) and social (p = .049), whereas command style was the only one showing a negative association, with FITPET result-orientation (p = .042). In line with Self-Determination Theory and non-linear pedagogy, findings suggest that shifting decision-making authority toward learners fosters a health-oriented interpretation of fitness evaluation and self-determined motivation. Despite the exploratory nature of this small-sample pilot, the study yields valuable baseline results for PE teachers' continuous professional development.

Keywords: Spectrum of Teaching Styles; physical education; physical-activity motivation.

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1. Introduction

School physical education (PE) is currently undergoing an epistemological shift, transitioning from dominant transmission and directive models toward student-centered and non-linear pedagogical frameworks (Chow, 2013; Davids et al., 2012).

Recent findings suggest that by involving learners across cognitive, social, and affective domains, modern pedagogical approaches have the potential to enhance motor learning and foster physical literacy development (Chatzipanteli et al., 2015; Espoz-Lazo et al., 2024; Castillo-Paredes et al., 2026; Carl et al., 2026).

This paradigm shift extends beyond curriculum content to the core of pedagogical mediation: recently, the quality of instructional delivery – rather than

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the subject matter itself – determines whether the educational experience promotes inclusion and motivation or induces alienation (Renshaw et al., 2010; Arufe-Giráldez et al., 2023).

In this context, one of the theoretical framework most widely recognized for categorizing this instructional variability is Mosston and Ashworth's Spectrum of Teaching Styles (2008), which places instructional approaches along a continuum based on the progressive shift of decision-making authority from teacher to learner (Pill et al., 2023).

The Spectrum delineates reproductive styles (command, practice, reciprocal, self-check and inclusion), focused on acquiring and replicating established motor patterns, from productive styles (guided discovery, convergent and divergent production, learner-designed individual program, learner-initiated, and self-teaching), designed to foster problem-solving, inquiry, and autonomous learning (Mosston & Asworth, 2008; Chatoupis, 2018). Moreover, recent findings, aligned with ecological dynamics and non-linear pedagogy, underscore the need to move beyond command-driven instruction toward deep, sustainable learning through practice variability and learner-centered environmental design (Espoz-Lazo et al., 2024; Chatoupis & Vagenas, 2017; Monacis et al., 2023; Monacis et al., 2026; Monacis, Pascali, & Colella, 2026).

Despite widespread theoretical integration of the Spectrum within teacher education, a significant discrepancy emerges between endorsed pedagogical frameworks and daily instructional design. Findings highlights a significant gap between teachers' self-reported practices and their effective classroom behaviors (Syrmpas et al., 2016; SueSee & Barker, 2019; Monacis et al., 2024). In this sense, understanding the determinants of teaching style variation is therefore essential for aligning pedagogical theory with applied practice, providing empirical grounding for pre- and in-service teachers training and ongoing professional development.

Within this framework, fitness assessment practices and physical activity motivation represent two recurring dimensions that shape student engagement in physical education. Rather than operating as neutral evaluative tools, fitness assessment exerts divergent psychological effects depending on their implementation mode: a health-oriented, self-evaluative focus yields markedly different outcomes than a performance-driven, normative approach. Recent frameworks operationalize this point, assessing the degree of pedagogical intentionality and responsibility guiding fitness testing practices (Blanco-Luengo et al., 2023).

At the same time, student participation stems from varied motives, ranging from intrinsic enjoyment and perceived skill to social connection.

Grounded into the Self-Determination theory, this framework shows that supporting autonomy, competence, and relatedness fosters genuine, self-directed motivation and builds habits that last well beyond the school years (Ryan et al., 1977; Frederick & Ryan, 1993; White et al., 2021; Ryan & Deci, 2000).

While all three constructs carry significant theoretical weight, to the best of our knowledge, research studies rarely examine the relations between them. Building on prior work documenting the benefits of the Spectrum for motor learning and student engagement in the Italian PE context (Monacis, Colella, & Limone, 2022; Monacis et al., 2026), this study shifts the analytical lens directly onto the teachers themselves as the primary focus of inquiry.

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This need become even more important in the light of Italy's current initial teacher qualification training pathways, aimed at developing both pre-service and in-service professional efficacy in the field of PE (Colella, 2018; Magill, Rudd, & Cronin, 2025). In this perspective, physical education teacher training should be re-oriented toward grasping the implicit meanings of motor assessment in order to generate a competence-oriented motivational climate (Presidenza del Consiglio dei Ministri, 2023).

This paper reports on the quantitative pilot phase of a larger multi-center project investigating the determinants of teaching styles variation among Italian physical education teachers. Specifically, the study aims to describe self-perceived teaching style usage within a sample of PE teachers in Apulia, and explore the relationship between teaching style frequency, their belief about fitness assessment, and motivation to be physically active. In addition, the authors examine whether teaching style adoption and related put comes differ according to teachers' personal and contextual factors (gender, school location, employment status, and school level). Given the exploratory design and modest sample size, findings are intended to offer preliminary directions for framing hypotheses and scaling subsequent confirmatory phases.

2. Materials and Methods

2.1 Study Design and Participants

An exploratory cross-sectional survey was conducted using a self-administered questionnaire. This study represents the quantitative pilot phase of a broader multi-center project aimed at profiling PE teachers' pedagogical behaviors and identifying their personal, contextual, and environmental determinants. Consistent with the preliminary nature of the study design, analyses were carried out on a descriptive and exploratory basis, with the goal of generating hypotheses for future observational and experimental phase of the project.

The sample, recruited through convenience sampling, included 26 (females = 14; males = 12) in-service PE teachers from schools in Apulia (Southern Italy). Gender distribution was balanced, with a mean age of 42.4±12.9 (age range = 26.67 years), indicating a heterogeneous sample in terms of professional experience and tenure.

The sample was also evenly distributed across the main contextual variables examined. Regarding school location, 12 teachers (46.2%) worked in urban settings and 14 (53.8%) in neighboring municipalities. In terms of employment status, 14 participants (53.8%) were tenure teachers and 12 (46.2%) held temporary contracts. Regarding school level, the sample included primary school teachers (n = 6, 23.1%), lower secondary school teachers (n = 12, 46.2%), and upper secondary school teachers (n = 8, 30.8%). Participation was voluntary and informed consent was obtained from all participants involved in the study. Research was approved by Pegaso Ethics Committee (PROT/E 009840 of 29/07/2026).

2.2 Procedure and Assessment Tools

Participants were asked to complete an online survey made of a demographic and contextual section alongside three standardized questionnaires.

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Based on Mosston and Ashworth's Spectrum of Teaching Styles, teachers were asked to report how frequently – during the school year - they employ each of the eleven styles (from A to K) using a five-point ordinal scale (0 = never; 1 = rarely; 2 = sometimes; 3 = frequently; 4 = almost always) (SueSee & Barker, 2019; Monacis et al., 2024).

The Italian adaptation of the Scale to Evaluate the Conscious Use of Physical Fitness Motor Tests by Physical Education Teachers (FITPET; Blanco-Luengo et al., 2023) was used to assess the conscious, health-oriented implementation of physical fitness testing.

The instrument comprises five dimensions, such as outcome orientation, use of participatory styles, educational approach, methodological rigor, and positive reinforcement – and yields an overall composite score. Items are rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The Italian adaptation of the Motives for Physical Activity Measure-Revised (MPAM-R; Ryan et al., 1997) was used to evaluate – on a 7-points Likert scale (1 = completely disagree, 7 = completely agree) motives underlying physical activity participation across five dimensions (interest/enjoyment, competence, appearance, fitness, and social interactions).

2.3 Statistical Analysis

Sample characteristics and variable distribution were summarized using descriptive statistics. Associations between the frequency of teaching styles usage and the dimensions of FITPET and MPAM-R questionnaires were evaluated using Spearman's rank correlation coefficient (rho) with 95% confidence intervals (C.I.). The strength of the associations was interpreted using standard thresholds for absolute values (weak <.30, moderate .30-.49, and strong >.50).

Group comparison was conducted using non-parametric tests. For dichotomous variables (gender, school location, and employment status), Mann-Whitney U tests were applied, with rank-biserial correlation as the measure of effect size. For the three-level variable (school level), Krustall-Wallis tests were used, reporting ε^2 as effect size. Significance was set at $\alpha = 0.05$. Statistical analyses were performed using R (RCore Team., 2025).

3. Results

Sample characteristics and descriptive statistics for all variables are summarized in Tables 1 and 2. Overall, teachers reported moderate and relatively uniform adoption across most teaching styles, with Practice and Guided Discovery being the most frequently employed, whereas styles centered on learner autonomy saw more limited adoption. FITPET scores and MPAM-R motivational dimensions were generally high and consistent overall.

Table 1. Sample characteristics.

Variable	Category	n	%
Gender	Male	12	46.2
Gender	Female	14	53.8
School location	City	12	46.2
School location	Neighbouring municipality	14	53.8
Contract type	Tenured	14	53.8
Contract type	Substitute	12	46.2
School level	Primary	6	23.1
School level	Lower secondary	12	46.2
School level	Upper secondary	8	30.8

Table 2. Measures descriptive statistics (Mdn = median, IQR = interquartile range (Q1–Q3).

Variable	M (SD)	Mdn	IQR	Min–Max
Teaching styles				
Command	2.35 (0.98)	2.0	2.0–3.0	0–4
Practice	2.81 (0.63)	3.0	2.0–3.0	2–4
Reciprocal	2.35 (0.89)	2.0	2.0–3.0	1–4
Self-check	1.92 (1.32)	2.0	1.0–3.0	0–4
Inclusion	2.38 (1.13)	2.5	1.0–3.0	1–4
Guided Discovery	2.54 (0.86)	3.0	2.0–3.0	0–4
Convergent Production	2.38 (0.98)	2.5	2.0–3.0	1–4
Divergent Production	2.19 (0.90)	2.0	2.0–3.0	0–4
Learner-Designed Program	1.88 (1.18)	2.0	1.3–2.8	0–4
Learner Autonomy	1.46 (1.21)	2.0	0.0–2.0	0–4
FITPET				
Result orientation	12.08 (1.83)	12.0	11.0–14.0	8–15
Use of participative styles	12.50 (1.73)	13.0	12.0–14.0	8–15
Educational approach	12.35 (1.55)	12.0	11.0–14.0	9–15
Methodological rigour	12.35 (1.41)	12.0	12.0–13.0	9–15
Positive reinforcement	12.23 (1.80)	12.0	11.0–13.0	7–15

FITPET total	61.50 (5.10)	60.5	59.3–66.0	51–71
MPAM-R				
Interest / Enjoyment	43.38 (6.92)	47.0	40.0–49.0	24–49
Competence	41.81 (6.48)	43.0	38.3–47.0	24–49
Appearance	29.77 (7.36)	30.5	24.5–34.8	12–42
Fitness	31.62 (4.63)	34.0	29.5–35.0	20–35
Social	21.31 (7.90)	22.0	15.3–28.0	6–35

Spearman rank correlations between teaching style usage frequency and the dimensions of both questionnaires are presented in Table 3 and 4 (only significant findings have been reported). Learner-centered styles showed the most consistent pattern. The reciprocal styles showed the strongest positive association with the overall FITPET score (rho = .55), as well as a positive correlation with the educational approach dimension. The learner-initiated style was positively associated with three MPAM-R dimensions: competence (rho = .53), interest/enjoyment, and social interaction. The inclusion style highlighted a positive association with positive reinforcement, whereas the command style was the only to present a significant negative association, specifically with the outcome orientation dimension. No statistically significant correlations were observed for the other styles.

Table 3. Spearman correlations between teaching styles use and FITPET dimensions.

Teaching style	Dimension	rho	95% CI	p
Command	Result orientation	-0.40*	[-0.70, -0.02]	0.042
Reciprocal	Educational approach	+0.43*	[+0.09, +0.70]	0.030
Reciprocal	FITPET total	+0.55**	[+0.24, +0.77]	0.004
Inclusion	Positive reinforcement	+0.39*	[-0.00, +0.70]	0.046

Table 4. Spearman correlations between teaching-style use and MPAM-R dimensions.

Teaching style	Dimension	rho	95% CI	p
Learner Autonomy	Interest / Enjoyment	+0.41*	[+0.03, +0.72]	0.036
Learner Autonomy	Competence	+0.53**	[+0.20, +0.78]	0.005
Learner Autonomy	Social	+0.39*	[-0.01, +0.70]	0.049

Group comparisons are presented in Table 5. Teaching styles usage appeared largely homogeneous across groups, with the only exception of a more frequent

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reliance on guided discovery among female teachers. Regarding outcome scores, employment status proved to be the most discriminating variable: temporary contract teachers reported higher scores in positive reinforcement (FITPET), and – most notably – in interest/enjoyment (MPAM-R), highlighting the largest effect size among group comparisons.

Additionally, total FITPET scores were slightly higher among male teachers. No differences emerged in relation to school location or school level.

However, these results are interpreted as exploratory trends to be confirmed in larger sample sizes.

Table 5. Between-group differences.

Outcome × factor	Variable	Test	Group medians	Stat.	p	Effect size (ε^2)
Style × Gender	Guided Discovery	Mann–Whitney U	Male: 2.0; Female: 3.0	46.5	0.037	0.446
FITPET × Gender	FITPET total	Mann–Whitney U	Male: 63.0; Female: 60.0	126.0	0.031	-0.500
FITPET × Contract type	Positive reinforcement	Mann–Whitney U	Tenured: 13.0; Substitute: 11.0	124.0	0.037	-0.476
MPAM-R × Contract type	Interest / Enjoyment	Mann–Whitney U	Tenured: 41.0; Substitute: 49.0	34.0	0.010	0.595

Figure 1. Differences in teaching styles use by group.

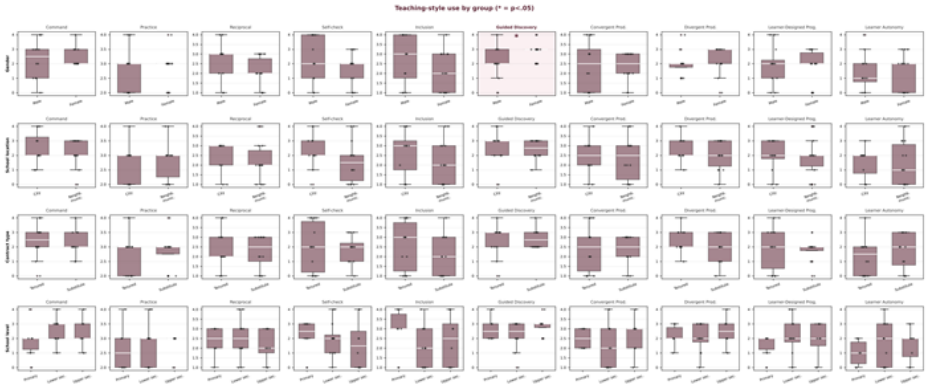


Figure 2. FITPET differences by group.

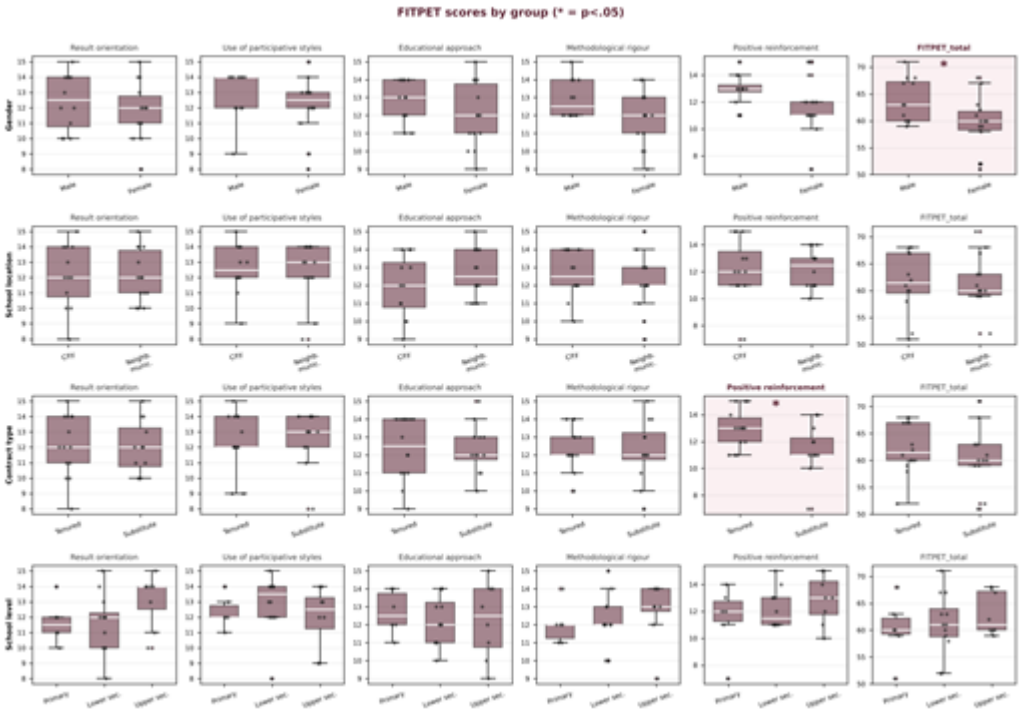
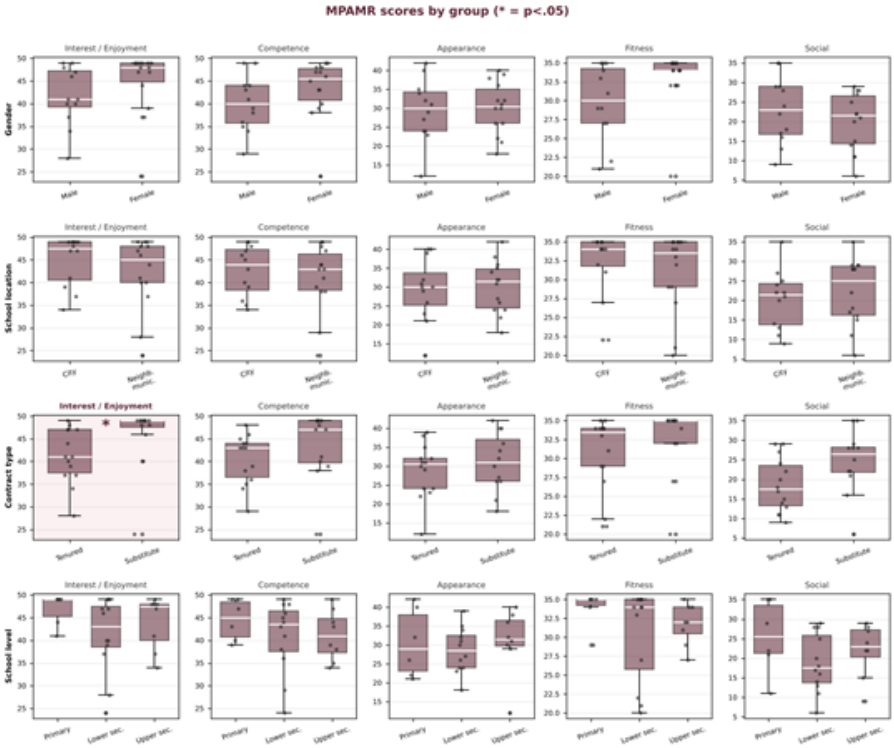


Figure 3. MPAM-R differences by group.



4. Discussion

The present study aimed to describe self-perceived teaching style use in a sample of PE teachers from Apulia and to explore its relationship with the conscious use of physical fitness test and motivation towards physical activity.

Although caution is recommended due to the pilot nature of the study design, the findings offer a potential coherent and theoretically interpretable framework that warrants discussion regarding both the direction of the observed results and the consequent methodological implications.

The most robust finding emerging from the analysis concerns the role of styles positioned toward the productive and learner-centered pole of the Spectrum. The reciprocal style showed the strongest association (rho = .55) and with the educational approach dimension, whereas the learner-initiated style was positively associated with competence, interest/enjoyment, and social interaction (Byra, 2006; Pill et al., 2023). This convergence aligns with the underlying theoretical framework: styles that shift decision-making autonomy toward the learner appear to be linked with a more educational and health-oriented implementation of fitness testing (Alfrey & Landi, 2022; Corbin, 2021) as well as intrinsic and relational motives for physical activity (. This interpretation closely aligns with the SDT perspective, which posits that environments supporting autonomy, competence, and relatedness foster more self-determined forms of motivation and deeper engagement (Ryan & Deci, 2000; White et al., 2021; Haerens et al., 2013; Vasconcellos et al., 2020).

Similarly, the command style was the only one to show a significant negative association with the FITPET orientation dimension. While requiring cautions interpretation, these results reinforce the differences between reproductive and productive approaches, not only regarding decision-making autonomy, but also in terms of pedagogical quality framing cross-cutting practices (Mosston & Ashworth, 2008; Colella, 2017). These findings suggest that is not so much the presence or absence of specific practices that makes the difference, but rather the way they are pedagogically (and intentionally) mediated by the teacher.

Teaching style usage appeared homogeneous across teacher subgroups, with the only exception of a more frequent adoption on guided discovery among female teachers. The picture regarding outcome scores was more complex. Employment status emerged as the most discriminating variable, with temporary contract teachers reporting higher scores in positive reinforcement and interest/enjoyment (Kulinna & Cothran, 2003; Cothran et al., 2005). By contrast, no differences emerged in relation to school location or school level.

This trend should be confirmed in larger sample size with further investigation.

The higher motivation perceived by temporary contract teachers might reflect career-stage, self-selection, or cohort dynamics rather than a substantive pedagogical advantage, highlighting teachers' professional conditions as a potential determinant of their motivational experience (Skaalvik & Skaalvik, 2017). However, this hypothesis cannot be solved in the present study and future studies are needed in subsequent project phases.

4.1 Methodological Implications

Despite the exploratory nature of the findings, the study offers some practical insights for PE teaching practice.

The association of learner-centered styles (reciprocal and learner-initiated styles) with a more educational implementation of fitness testing and self-determined motivation suggests that teachers should complement dominant reproductive styles with a more frequent, intentional adoption of productive styles. Gradually incorporating peer-directed tasks featuring reciprocal observation and feedback, open-ended problem-solving activities, and opportunities for student choice can foster not only motor learning, but also students' perception of competence, enjoyment and social interactions.

Moreover, the findings encourage viewing physical fitness assessment not as a selective or performance-driven action, but as an educational opportunity. Delivering formative feedback, promoting self-evaluation and mindful data interpretation among students, and integrating fitness tests into health- and autonomy-oriented learning pathways represent strategies consistent with a participatory approach and the use of positive reinforcement.

Finally, prioritizing students' interest, enjoyment and perception of competence means treating motivation as a primary outcome of instructional practice. From this perspective, teaching styles variation becomes a key strategy to support lifelong physical activity adherence and physical literacy development.

4.2 Study Limitations and Future Perspectives

The findings must be interpreted in light of some limitations. First, the small and convenience sample size results in relatively small subgroups the limit the

validity and generalizability of the findings. Second, the cross-sectional and correlational design precludes causal inferences, and the exclusive self-reported measures may have inflated consistency among constructs sharing the same measurement method.

Furthermore, these findings should be considered preliminary, as not all questionnaires have been formally validated (to date) within this specific sample of PE teachers.

Future studies will aim to compare self-reported data with systematic video-recorded observation of learning episodes, as well as to implement targeted professional training interventions to specific teacher profiles to evaluate their impact on students' motor learning and physical literacy development.

5. Conclusions

This pilot study shows that learner-centered teaching styles (reciprocal and learner-initiated) align with health-oriented fitness testing and intrinsic student motivation, whereas command-driven instruction shows the opposite pattern. Although these findings should be treated as exploratory, they establish a consistent empirical baseline for subsequent confirmatory project phases. Finally, fostering student engagement depends on the quality of pedagogical mediation and teacher flexibility across the Spectrum, highlighting the need for targeted, evidence-based teacher training to promote lifelong physical literacy.

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