Self-perceived and manifest knowledge of the teaching styles of internship Physical Education teachers

Conocimiento autopercibido y manifiesto de los estilos de enseñanza de los profesores de Educación Física en prácticas

Authors

Antero Abreu [1]
Paulo Nobre [1]

[1] University of Coimbra (Portugal)

Corresponding author:
Antero Abreu
anteroabreu@fcdef.uc.pt

Received: 16-12-25
Accepted: 10-01-26

How to cite in APA

Abreu, A., & Nobre, P. (2026). Self-perceived and manifest knowledge of the teaching styles of internship Physical Education teachers. *Retos, 75*, 684-697. https://doi.org/10.47197/retos.v76.118372

Abstract

Introduction: Context diversity requires teachers to be competent to adapt their teaching methods to respond to this diversity. Understanding physical education (PE) teachers' knowledge in their initial training about the spectrum of teaching styles (TS) is therefore essential for a thorough understanding of their preparedness to address diversity.
Objective: To identify the self-perceived and manifest knowledge about TS in PE and its relationship, in internship teachers.
Methodology: A questionnaire was applied to 121 teachers who had completed their internship, at master courses from six Portuguese universities. Data were analyzed using non-parametric descriptive statistics and the Point-Bisserial Correlation Coefficient Test.
Results: Both self-perceived and manifest knowledge are greater in command style (A) and lower in divergent discovery (H) and there is an association between self-perceived and manifest knowledge in command (A), practice (B), reciprocal (C) and divergent discovery (H) styles. There are no statistically significant differences in the degree of self-perceived and manifest knowledge of TS according to the gender.
Discussion: Both self-perceived and manifest levels of knowledge decrease across the spectrum, from the reproduction to the production cluster, in line with other studies. Findings highlighted disparities between self-perceived knowledge and manifest knowledge.
Conclusions: Internship teachers overestimate their self-perceived degree of knowledge in relation to manifest knowledge, with lower correspondence in production cluster, suggesting lack of preparation regarding these teaching styles.

Keywords

Physical Education; internship teachers; self-perceived knowledge; teaching styles.

Resumen

Introducción: La diversidad contextual exige que el profesorado sea competente para adaptar sus métodos de enseñanza y responder a dicha diversidad. Comprender el conocimiento del profesorado de Educación Física (EF) durante su formación inicial sobre el Espectro de Estilos de Enseñanza (EE) es esencial para comprender su preparación para abordar la diversidad.
Objetivo: Identificar el conocimiento autopercibido y manifiesto sobre los EE en EF, e su relación, en profesores en prácticas.
Metodología: Se aplicó un cuestionario a 121 profesores que habían completado sus prácticas, en cursos de formación de profesores de máster de seis universidades portuguesas. Los datos se analizaron utilizando estadísticas descriptivas no paramétricas y la prueba del Coeficiente de Correlación Biserial Puntual.
Resultados: Conocimiento autopercibido y manifiesto son mayores en el estilo de Mando y menores en la Descubrimiento Divergente e existe una asociación entre el conocimiento autopercibido y el manifiesto en los estilos de Mando, Práctica, Recíproco y Descubrimiento Divergente. No se observan diferencias significativas en el grado de conocimiento autopercibido y manifiesto de los EE en función del sexo.
Discusión: Tanto el nivel de conocimiento autopercibido como el manifiesto disminuyen a lo largo del espectro, desde el grupo de Reproducción hasta el de Producción, como en otros estudios. Se verifican disparidades entre el conocimiento autopercibido y el manifiesto.
Conclusiones: Los profesores en prácticas sobreestiman su grado de conocimiento autopercibido en relación con el conocimiento manifiesto, con menor correspondencia en el grupo de Producción, lo que sugiere una preparación incompleta en relación con estos estilos de enseñanza.

Palabras clave

Educación Física; profesores en prácticas; conocimiento autopercibido; estilos de enseñanza.

Introduction

Physical Education (PE) is, nowadays, a fundamental human right and a structuring pillar in the integral development of the individual. The publication Quality Physical Education: Guidelines for Policy-Makers (UNESCO, 2015) consolidated this movement, unequivocally stating that Physical Education is a fundamental human right and a structuring pillar in the integral development of the individual.

From this perspective, Physical Education should not be understood as an accessory subject in the school curriculum or as a mere motor activity, but rather as an essential educational domain in the promotion of physical, cognitive, social, emotional and ethical skills that support active and healthy participation in contemporary society.

Currently, society demands that schools not only teach, but also educate, include and prepare students for the transition to the ever-changing world of work. In this context, one of the biggest concerns for teachers is knowing the best way to teach (Kulinna & Cothran, 2003; Maquera-Maquera et al., 2025).

In the case of Physical Education, Muska Mosston (1966) realised that teaching experiences, no matter how successful, were based mainly on fragmented ideas and isolated techniques of teachers, i.e. personal idiosyncrasies, and did not constitute a cohesive structure that could serve as a broad and integrated guide for teaching future teachers. In this context, Mosston and Ashworth (1986, 1994, 2002) defined a spectrum of teaching styles as a reference for Physical Education teachers, which contributes to the processes of differentiation teaching and student inclusion (Mosston & Ashworth, 1985).

In the last two decades we have seen, in Portugal and in general, the mobilization of terms such as 'autonomy', 'critical thinking', 'creative thinking', 'reasoning', 'problem solving', 'innovation' in curriculum standards and other curricular documents, which presuppose a constructivist view of learning (Barker et al., 2013), replacing traditional teaching with more student-centered styles. These curriculum documents do not define how such learning can be achieved by students, assuming that teachers know and know how to apply appropriate pedagogy to achieve such goals (Suesee & Barker, 2019).

Teaching styles then emerge as a methodological strategy that helps Physical Education teachers achieve the teaching objectives in their classes, underpinned by a spectrum of shared decision-making between teachers and students (Ashworth, 1992; Goldberger et al., 2012; Murillo & Espada-Mateos, 2021). Some studies show that student satisfaction in Physical Education is achieved when teachers apply appropriate teaching approaches that meet the needs of the students (Wibowo et al., 2025).

Revisiting the spectrum of teaching styles

When proposing the spectrum as a teaching theory, Mosston and Ashworth (2002, 2008) established six premises in their base structure: i) as an axiom, they assumed teaching behavior is a chain of decision-making in which teaching styles can be typified; ii) each teaching style has its own anatomy, composed of three decision categories, pre-impact, impact, and post-impact; iii) teacher and students are decision-maker agents in teaching process, with a proportionally inverse involvement along the spectrum; iv) a spectrum of eleven teaching styles is defined, from teaching by command (A), where the teacher is responsible for all decision categories, up to the self-teaching (K), in which the student now has all the power of decision; v) teaching styles are organized into two groups, the teacher-centered reproduction styles [command (A), practice (B), reciprocal (C), self-check (D) and inclusion (E)], and production styles, [guided discovery (F), convergent discovery (G), divergent discovery (H), learner-designed individual program (I), learner-initiated (J) and self-teaching (K)], where the students are invited to discover solutions to new problems and to produce of their own knowledge; and finally, vi) five vectors are founded, the cognitive, physical, social, emotional and ethical (or moral) vectors, as the channels of development that are to be pursued by learning goals, resulting from each class objectives.

Reviews of studies carried out on the spectrum of teaching styles conclude that the reproduction group was the most studied (Byra, 2000, 2006; Chatoupis, 2009), which are also the styles most used by PE teachers (Ayuso, 2017; Chatoupis, 2018; Cothran et al., 2005; Curtner-Smith et al., 2001; Espada-Mateos & Canadas, 2022; Fernández-Rivas & Espada-Mateos, 2021; Gozzi & Ruete, 2006; Hein et al., 2012; Ince & Hunuk, 2010; Jaakkola & Watt, 2011; Longoria et al., 2020; Xu et al., 2023). However, in most studies carried out, no significant differences were found in the efficiency of the application of different styles in student learning (Cuéllar & Delgado, 2000). Nevertheless, when teachers become more familiar with

different teaching styles and are able to use and combine them, they can promote increased student performance and better respond to the demanding standards of educational reforms (Biddle & Goudas, 1993; Delgado et al., 1996; Doolan & Honigsfeld, 2000; Silverman, 1991), as well as overcoming the absence or insufficiency of objectives associated with cognitive, social, emotional and ethical development channels, which sometimes occurs when planning PE classes (Muniz & Krebs, 2009).

It is now known that teachers with more years of experience tend to use teacher-centered teaching styles more often, such as command (A), while younger and less experienced teachers identify and value Production styles more (Fernández-Rivas & Espada-Mateos, 2019, 2021; Merino-Barrero et al., 2017). Furthermore, Fernández-Rivas & Espada-Mateos (2017) concluded that older teachers use fewer teaching styles, are less concerned about their use than younger teachers, and consider internships to be useful for their training.

It is not always easy to identify what teachers know about the spectrum, if this knowledge is based on their own perception of their practices.

This study aims to characterize internship teachers of Physical Education in relation to self-perceived and manifest knowledge of the teaching styles, based on the following objectives:

1. To identify the level of self-perceived knowledge of teaching styles among internship Physical Education teachers;
2. To assess manifest knowledge of teaching styles among internship Physical Education teachers;
3. To understand if there is a relationship between self-perceived and manifest knowledge of teaching styles.
4. To examine potential differences in self-perceived and manifest knowledge of teaching styles between female and male internship teachers.

In this article, we explore knowledge of teaching styles, comparing what teachers think they know after their internship with the knowledge they actually demonstrate.

Method

This study adopted a quantitative methodology and an exploratory cross-sectional survey design. Data was collected through a questionnaire, aimed at characterizing the self-perceived and manifest knowledge of teaching styles (Mosston & Ashworth, 2002, 2008) in internship Physical Education teachers.

Participants

For this research, a non-probabilistic and intentional sampling process by network or "snowball" (Fortin, 2009) was used, which is normally used in exploratory studies with populations that are difficult to access. In our study we did not have direct access to the contacts of the internship teachers from each university, due to the General Data Protection Regulation (GDPR) of the European Union (EU) and the specific policies adopted by each institution, which made it impossible to know the exact number of internship teachers, leaving no basis for calculating the universe and sampling error, which compromises the representativeness of the sample. In order to reduce bias and better reflect the Portuguese reality, all public universities offering master's degrees in teaching Physical Education were included and only interns with institutional email addresses validated by the master's program coordination had access to the questionnaire. This study included a sample of 121 internship teachers of Physical Education. [n=54 women (44.6%) and n=67 men (55.4%)], with an average age of 27,2 ± 6.0 years, integrated into the 2nd year of the Master's Degree in Physical Education Teaching in Basic and Secondary Education, belonging to six Portuguese public Universities [Beira Interior (n=2), Trás-os-Montes e Alto Douro (n=8), Madeira (n=10), Lisboa (n=19), Porto (n=20) and Coimbra (n=62)].

Procedure

The questionnaire was administered online via the LimeSurvey platform, and data collection was completed in July 2023. The anonymity of respondents was guaranteed in accordance with EU Regulation

2016/679, and informed consent was requested for the use of data for research purposes. The questionnaire was sent by email, through master course coordinators', to all internship teachers at Portuguese public universities offering master's course in Physical Education Teaching in Primary and Secondary Education, and was available for response for one month, during which time multiple seeds in a weekly reminder was sent. Data from all participants who voluntary completed the entire questionnaire were considered for analysis, excluding those who responded incompletely.

By applying the questionnaire, we wanted, firstly, to know the degree of self-perceived knowledge that internship teachers of Physical Education considered to have about the first 8 teaching styles of the Mosston and Ashworth Spectrum (2002, 2008), using a 5-point Likert scale (1 - I don't know; 2 - I know badly; 3 - I know reasonably; 4 - I know well; 5 - I know perfectly) and, secondly, understand if this self-perception corresponded to manifest knowledge, checking whether the respondents made a correct matching of each teaching style to a set of 4 indicators characteristic of each style, referring to the dimensions "teacher's role", "student`s role", "feedback" and "general implications". The analysis was limited to the first eight teaching styles in the Spectrum, on the understanding that the last three styles are extremely difficult for inexperienced teachers to put into practice.

This research project was approved by the Ethics Committee for Health of the Faculty of Sport Sciences and Physical Education of University of Coimbra, with registration number CE/FCDEF-UC/00642020 and has complied with the instructions contained in Regulation (EU) No. 2016/679 of the European Parliament and the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and the free movement of this data have been respected, and by recommendations and instructions issued by National Data Protection Commission (CNPD).

Instrument

The instrument used in this research was the Questionnaire of Knowledge and Use of Teaching Styles (QKUTS). The elaboration of the questionnaire approached the set of suggested steps by Fortin (2009): determining the information to be collected; creating a set of questions; formulating and ordering the questions; submitting the draft questionnaire for review and pre-testing; and finally, writing the introduction and instructions. The questionnaire was reviewed by a panel of three experts from Faculty of Sports Science and Physical Education, Coimbra University. A Cronbach's alpha (α) = 0.901 was found for items that assess self-perceived knowledge and a Cronbach's alpha coefficient (α) = 0.702 for items that assess manifest knowledge.

Data analysis

To identify the degree of self-perceived and manifest knowledge of the internship teachers, the data were analyzed using descriptive statistics not parametric, through frequencies customized tables.

Furthermore, inferential statistics were used, namely the Point-Biserial Correlation Coefficient Test (rpb), to check whether there was an association between the degree of self-perceived knowledge and the degree of manifest knowledge of the participants, assuming the significance level (p=.05) and the effect size accordingly with Cohen's proposal (1988, 1992): r=0 [no effect], r=0.10 [effect small], r=0.30 [medium effect], r=0.50 [large effect] and r=1 [perfect effect].

Despite of the measurement scale of the variable "degree of self-perceived knowledge" being ordinal (from 1 - I don't know to 5 - I know perfectly), as it is a multiple item scale (Likert scale), we chose to treat it as if it had the characteristics of interval variables, in line with what is defended by Labovitz (1970) and by Bryman and Cramer (1993).

The Mann-Whitney U test was applied to assess potential differences in the degree of self-perceived and manifest knowledge of teaching styles between female and male internship teachers, given that the assumptions underlying parametric tests were violated (Field, 2017). The data were analyzed with using the IBM SPSS Statistics program, version 28.0.

Results

The level of self-perceived knowledge of the first 8 teaching styles of the spectrum is presented in Table 1. The results show that internship teachers of Physical Education perceive that they have a high average

knowledge about the aforementioned teaching styles (M=4.10±0.90 - "I know well"), being higher in the styles of the reproduction group than in the production cluster. Furthermore, there is a progressive decrease as one moves along the spectrum towards more student-centered styles, with the exception of guided discovery teaching style (F) (M=4.36±0.88 – "I know well"), which appears in third place. The teaching styles in which internship teachers perceive greater knowledge are command (A) (M=4.61±0.70 - "I know perfectly") and practice (B) (M=4.51±0.73 - "I know perfectly") and those who perceive less knowledge are convergent discovery (G) (M=3.41±1.20 - "I know reasonably") and divergent discovery (H) (M=3.31±1.25 - "I know reasonably").

Table 1. Degree of self-perceived knowledge of teaching styles

Teaching Styles	1 I don`t know	2 I know badly	3 I know reasonably	4 I know well	5 I know perfectly	Total	M	SD
	Freq. (n)							
Command (A)	1	0	9	25	86	121	4.61	0.70
Practice (B)	1	0	11	33	76		4.51	0.73
Reciprocal (C)	4	2	16	40	59		4.22	0.97
Self-Check (D)	3	1	21	37	59		4.22	0.94
Inclusion (E)	2	1	26	36	56		4.18	0.91
Guided Discovery (F)	2	2	15	34	68		4.36	0.88
Convergent Discovery (G)	12	10	41	32	26		3.41	1.20
Divergent Discovery (H)	15	12	39	31	24		3.31	1.25
Total (M)	5.00	3.50	22.30	33.50	56.80	121	4.10	0.90

Table 2 presents differences, although not statistically significant (p > .05), in the degree of self-perceived knowledge of teaching styles between male and female internship teachers of Physical Education. Despite this, female perceive themselves to have greater knowledge than their male counterparts in the command (A), practice (B), reciprocal (C), self-check (D), inclusion (E), and guided discovery (F) teaching styles. On the other hand, male perceive themselves to have greater knowledge than female in the convergent discovery (G) and divergent discovery (H) teaching styles.

Table 2. Degree of self-perceived knowledge of teaching styles, by gender

Degree of self-perceived knowledge of teaching styles, by gender						
Teaching Styles	Gender	*Median* (M_d)	*Variance* (S^2)	*Mann-Witney (U)*		
				Mean Rank	*U*	*Sig.*
Command (A)	Female (N=54)	5	.24	63.80	1658.00[a]	.322
	Male (N=67)	5	.68	58.75		
Practice (B)	Female (N=54)	5	.39	64.71	1608.50	.222
	Male (N=67)	5	.64	58.01		
Reciprocal (C)	Female (N=54)	5	.76	65.11	1587.00	.208
	Male (N=67)	4	1.08	57.69		
Self-Check (D	Female (N=54)	4	.73	62.04	1753.00	.752
	Male (N=67)	4	1.00	60.16		
Inclusion (E)	Female (N=54)	4	.75	62.78	1713.00	.590
	Male (N=67)	4	.91	59.57		
Guided Discovery (F)	Female (N=54)	5	.73	61.01	1808.50	.998
	Male (N=67)	5	.84	60.99		
Convergent Discovery (G)	Female (N=54)	3	1.30	56.69	1576.50	.209
	Male (N=67)	4	1.56	64.47		
Divergent Discovery (H)	Female (N=54)	3	1.58	57.06	1596.00	.252
	Male (N=67)	4	1.55	64.18		
Total	121					

* Significant differences, p<.05.
a. Homogeneity of variances not assumed.

In the following tables we can perceive the contrast between self-perceived and manifest knowledge of each teaching style, that is, checking whether the internship teachers correctly matched the indicators characteristic of each teaching style to the respective style. Furthermore, we also checked whether there is an association between the degree of self-perceived knowledge, at first, and the degree of knowledge effectively demonstrated (manifest), through the results of the Point-Biserial Correlation Coefficient Test (rpb).

In table 3 we can see that, of the 121 respondents, only 1 (1%) indicated the "I don't know" answer option for the command teaching style (A), with the remaining 120 internship teachers marking answers between "I know reasonably" and "I know perfectly." This high degree of self-perceived knowledge also had expression in a high degree of manifest knowledge, given that 114 internship teachers (94%) correctly matched the indicators characteristic of this style. The results also suggest that there is a significant positive association, with a small effect, between self-perceived and manifest knowledge of the command teaching style (A) [rpb=.268, p=.003], that is, greater self-perceived knowledge is associated with greater manifest knowledge.

Table 3. Degree of manifest knowledge: command teaching style (A)

Command teaching style (A)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	1 (100%)	0 (0%)	1 (100%)
	I know badly	0 (0%)	0 (0%)	0 (100%)
	I know reasonably	1 (11%)	8 (89%)	9 (100%)
	I know well	2 (8%)	23 (92%)	25 (100%)
	I know perfectly	3 (4%)	83 (96%)	86 (100%)
Total		7(6%)	114 (94%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.268*	.003	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

In Table 4, we see that only 1 internship teacher (1%) answered "I don`t know" the practice teaching style (B), with the remaining 120 respondents (99%) to report knowing this teaching style. This self-perceived knowledge corresponds to high manifest knowledge, with 73 internship teachers (60%) correctly matching the indicators to the respective teaching style, although there is a marked decrease compared to the evidenced in command teaching style (A), given that 48 respondents (40%) did not get this match right. The results also show that there is a significant positive association, with a small effect, between self-perceived knowledge and manifest knowledge of the practice teaching style (B) [rpb=.222, p=.014], that is, greater self-perceived knowledge is associated with greater manifest knowledge.

Table 4. Degree of manifest knowledge: practice teaching style (B)

Practice teaching style (B)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	1 (100%)	0 (0%)	1 (100%)
	I know badly	0 (0%)	0 (0%)	0 (100%)
	I know reasonably	6 (55%)	5 (45%)	11 (100%)
	I know well	17 (52%)	16 (48%)	33 (100%)
	I know perfectly	24 (32%)	52 (68%)	76 (100%)
Total		48 (40%)	73 (60%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.222*	.014	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

In Table 5, we can see those 115 internship teachers (95%) consider they know the reciprocal teaching style (C), with the remaining 6 (5%) to indicate that they did not know enough this teaching style. Such self-perceived knowledge was confirmed as manifest knowledge for the majority of respondents, given that 100 (83%) of 121 respondents correctly selected the teaching style for the indicators presented. We can also observe that there is a significant positive association, of small effect, between self-perceived knowledge and manifest knowledge of the reciprocal teaching style (C) [rpb=.286, p=.001], that is, greater self-perceived knowledge is associated with greater manifest knowledge.

Table 5. Degree of manifest knowledge: reciprocal teaching style (C)

Reciprocal teaching style (C)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	3 (75%)	1 (25%)	4 (100%)
	I know badly	1 (50%)	1 (50%)	2 (100%)
	I know reasonably	3 (19%)	13 (81%)	16 (100%)
	I know well	8 (20%)	32 (80%)	40 (100%)
	I know perfectly	6 (10%)	53 (90%)	59 (100%)
Total		21 (17%)	100 (83%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.286*	.001	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

In Table 6, we can see that only 3 internship teachers (3%) indicated the answer "I don't know" and 1 internship (1%) answered "I know badly" the self-check teaching style (D), with the remaining 117 (96%) indicating that they know this style. As for manifest knowledge, the majority of respondents (79%) correctly identified this teaching style. However, there is no association between the degree of self-perceived and manifest knowledge in the self-check teaching style (D) [rpb=.082, p>.05].

Table 6. Degree of manifest knowledge: self-check teaching style (D)

Self-Check teaching style (D)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	0 (0%)	3 (100%)	3 (100%)
	I know badly	1 (100%)	0 (0%)	1 (100%)
	I know reasonably	8 (38%)	13 (62%)	21 (100%)
	I know well	5 (13%)	32 (87%)	37 (100%)
	I know perfectly	12 (20%)	47 (80%)	59 (100%)
Total		26 (21%)	95 (79%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.082*	.371	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

In Table 7, we see that 120 internship teachers (99%) give answers between "I know reasonably" and "I know perfectly" about the inclusion teaching style (E), self-perceiving a high degree of knowledge. However, more than half (51%) matched the indicators incorrectly, not confirming such a high degree of manifest knowledge, in this teaching style. There is no association between respondents' responses for self-perceived and manifest knowledge [rpb=.150, p>.05].

Table 7. Degree of manifest knowledge: inclusion teaching style (E)

Inclusion teaching style (E)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	2 (100%)	0 (0%)	2 (100%)
	I know badly	1 (100%)	0 (0%)	1 (100%)
	I know reasonably	14 (54%)	12 (46%)	26 (100%)
	I know well	20 (56%)	16 (44%)	36 (100%)
	I know perfectly	25 (45%)	31 (55%)	56 (100%)
Total		62 (51%)	59 (49%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.150*	.100	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

In Table 8, we see that 117 interns (97%) reported high knowledge of the guided discovery teaching style (F). However, less than half of the respondents (46%) correctly matched the indicators to this teaching style, and it was found that of the 68 internship teachers who answered "I know perfectly well",

38 (56%) made an incorrect match. The results also show that there is no association between self-perceived and manifest knowledge in this teaching style [rpb=.002, p>.05].

Table 8. Degree of manifest knowledge: guided discovery teaching style (F)

Guided Discovery teaching style (F)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	1 (50%)	1 (50%)	2 (100%)
	I know badly	2 (100%)	0 (0%)	2 (100%)
	I know reasonably	8 (53%)	7 (47%)	15 (100%)
	I know well	16 (47%)	18 (53%)	34 (100%)
	I know perfectly	38 (56%)	30 (44%)	68 (100%)
Total		65 (54%)	56 (46%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.002*	.984	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

Table 9 reveals that only 22 internship teachers (18%) state that they do not have sufficient knowledge about the convergent discovery teaching style (G). Interestingly, 70 (58%) of the 121 respondents did not correctly match indicators to this teaching style, with only 51 (42%) to show manifest knowledge. The results also show that there is no association between responses to self-perceived and manifest knowledge in the convergent discovery teaching style (G) [rpb=.125, p>.05].

Table 9. Degree of manifest knowledge: convergent discovery teaching style (G)

Convergent Discovery teaching style (G)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	9 (75%)	3 (25%)	12 (100%)
	I know badly	7 (70%)	3 (30%)	10 (100%)
	I know reasonably	23 (56%)	18 (44%)	41 (100%)
	I know well	17 (53%)	15 (47%)	32 (100%)
	I know perfectly	14 (54%)	12 (46%)	26 (100%)
Total		70 (58%)	51 (42%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	
Pearson Correlation		.125*	.173	
N of valid cases		121		

* The correlation is significant, p<.05 (2-tailed).

In Table 10, we observe that the divergent discovery teaching style (H) is the one with lowest degree of self-perceived knowledge, with 27 respondents (22%) considering that they did not have sufficient knowledge of this teaching style. Furthermore, the number of internship teachers who do not present manifest knowledge is much superior, as 70 internship teachers (58%) did not make a correct correspondence of the indicators to the respective teaching style, with only 51 respondents (42%) showing manifest knowledge. Despite this, there is a significant positive association, of medium effect, between self-perceived and manifest knowledge in this teaching style [rpb=.301, p<.001], that is, greater self-perceived knowledge is associated with greater manifest knowledge.

Table 10. Degree of manifest knowledge: divergent discovery teaching style (H)

Divergent Discovery teaching style (H)		Manifest knowledge		Total
		wrong correspondence	right correspondence	
		Freq. (%)		
Self-perceived knowledge	I don`t know	14 (93%)	1 (7%)	15 (100%)
	I know badly	10 (83%)	2 (17%)	12 (100%)
	I know reasonably	21 (54%)	18 (46%)	39 (100%)
	I know well	13 (42%)	18 (58%)	31 (100%)
	I know perfectly	12 (50%)	12 (50%)	24 (100%)
Total		70 (58%)	51 (42%)	121 (100%)
Point-Biserial Correlation Coeficient Test (*rpb*)				
		Value	Significance (2-tailed)	

Pearson Correlation	.301*	<.001
N of valid cases	121	

* The correlation is significant, p<.05 (2-tailed).

Table 11 shows that Physical Education internship teachers demonstrate a higher degree of manifest knowledge of the command (A) [94%], reciprocal (C) [83%], self-check (D) (79%), and practice (B) [60%] teaching styles, with the majority of Physical Education internship teachers correctly matching the characteristic indicators of each teaching style to the respective style. On the other hand, in the inclusion (E), guided discovery (F), convergent discovery (G) and divergent discovery (H) teaching styles, the majority of Physical Education internship teachers made an incorrect match between the indicators and the respective teaching styles, revealing gaps in their understanding and effective mastery of these teaching styles. It is therefore evident that in the first teaching styles of the spectrum, which are more teacher-centred, the degree of overt knowledge is higher, decreasing as one moves towards the teaching styles of the production group, which are more student-centered.

Table 11. Degree of manifest knowledge of teaching styles

Degree of manifest knowledge of teachin styles				
Teaching styles	wrong correspondence	right correspondence	Total	
	Freq. (%)			
Command (A)	7 (6%)	114 (94%)	121	100%
Practice (B)	48 (40%)	73 (60%)		
Reciprocal (C)	21 (17%)	100 (83%)		
Self-Check (D)	26 (21%)	95 (79%)		
Inclusion (E)	62 (51%)	59 (49%)		
Guided Discovery (F)	65 (54%)	56 (46%)		
Convergent Discovery (G)	70 (58%)	51 (42%)		
Divergent Discovery (H)	70 (58%)	51 (42%)		

Table 12 shows that there are differences, although not statistically significant (p > 0.05), in the degree of manifest knowledge of teaching styles between male and female Physical Education internship teachers. Female shows a higher degree of manifest knowledge, than male, of the command (A), practice (B), reciprocal (C), and inclusion (E) teaching styles, while male reveal a higher degree of manifest knowledge, than female, of the self-check (D), guided discovery (F), convergent discovery (G), and divergent discovery (H) teaching styles, which, to some extent, is congruent with the degree of self-perceived knowledge reported previously.

Table 12. Degree of manifest knowledge of teaching styles, by gender

Degree of manifest knowledge of teaching styles, by gender						
Teaching Styles	Gender	Median (M_d)	Variance (S^2)	Mann-Witney (U)		
				Mean Rank	U	Sig.
Command (A)	Female (N=54)	1	.02	63.38	1680.50[a]	.098
	Male (N=67)	1	.08	59.08		
Practice (B)	Female (N=54)	1	.24	62.59	1723.00	.597
	Male (N=67)	1	.25	59.72		
Reciprocal (C)	Female (N=54)	1	.12	63.60	1665.50[a]	.254
	Male (N=67)	1	.17	58.86		
Self-Check (D	Female (N=54)	1	.19	59.44	1724.50	.536
	Male (N=67)	1	.16	62.26		
Inclusion (E)	Female (N=54)	1	.25	62.87	1708.00	.543
	Male (N=67)	0	.25	59.49		
Guided Discovery (F)	Female (N=54)	0	.25	59.89	1749.00	.717
	Male (N=67)	0	.25	61.90		
Convergent Discovery (G)	Female (N=54)	0	.24	59.03	1702.50	.516
	Male (N=67)	0	.25	62.59		
Divergent Discovery (H)	Female (N=54)	0	.23	56.79	1581.50[a]	.165
	Male (N=67)	0	.25	64.40		
Total	121					

* Significant differences, p<.05.
a. Homogeneity of variances not assumed.

Discussion

Physical Education internship teachers report a high degree of self-perceived knowledge of teaching styles, with this level being highest in the reproduction group and decreasing as we move from teacher-centered to student-centered teaching styles. These results are in line with several other studies (Ayuso, 2017; Cothran et al., 2005; Curtner-Smith et al., 2001; Espada-Mateos & Pineño, 2020; Espada-Mateos & Canadas, 2022; Fernández-Rivas & Espada-Mateos, 2021; Gozzi & Ruete, 2006; Hein et al., 2012; Ince & Hunuk, 2010; Jaakkola & Watt, 2011; Longoria et al., 2020; XU et al., 2023; Marín Rojas et al., 2025) who concluded that reproduction teaching styles are the most used by Physical Education teachers in their classes, because these teachers mobilize teaching styles that they experienced more as students and that they know best or feel most comfortable teaching in their classes (Cothran et al, 2005; Kulinna & Cothran, 2003; Nájera et al., 2020). On the other hand, the results of our study do not seem to reinforce the idea that younger and less experienced teachers identify and value production teaching styles more (Fernández-Rivas & Espada-Mateos, 2019; Merino-Barrero et al., 2017), which calls into question the quality of internship teachers' learning about teaching styles.

Furthermore, there appears to be an overestimation of self-perceived knowledge, given that manifest knowledge revealed is always inferior to the self-perceived knowledge. This is consistent with the results of previous studies, showing that teachers overestimate the variety of pedagogical behaviours they use (Mosston & Ashworth, 2002; Parsak & Sarac, 2020), which also seems to be true with regard to the theoretical domain of teaching styles.

Manifest knowledge was greater in the command (94%), reciprocal (83%), self-check (79%) and practice (60%) teaching styles and lower in other teaching styles, highlighting possible gaps in the domain of actual understanding. The results also show us that there is an association between self-perceived and manifest knowledge in the command (A), practice (B), reciprocal (C) and divergent discovery (H) teaching styles, which is not the case for the remaining styles. In fact, correlation exists in teaching styles where there was greater and lesser perception of knowledge from internship teachers, which suggests a more refined understanding of teaching styles at opposite ends of the spectrum.

Our results are consistent with those obtained by SueSee and Barker (2019), with Physical Education teachers from Sweden, who concluded that although teachers reported frequently using all teaching styles in their classes, the actual use, identified through observation of their classes, revealed only three teaching styles: practice (B), divergent discovery (H) and self-check (D), with the latter two having only residual use. Our results are also aligned with those obtained by Parsak and Sarac (2020), who found that although Turkish Physical Education teachers reported using all teaching styles, the practical use in classes showed that teachers used the command (A) and practice (B) teaching styles for most of the class time. Similarly, the study by Marín Rojas et al. (2025) demonstrated that future Chilean Physical Education teachers show only a partial appropriation of teaching styles. This suggests incomplete knowledge and a lack of understanding of the value of teaching styles, their characteristics, and their implications for teaching and learning, with consequences for both planning and their use as a strategy for addressing diversity in PE classes.

Overall, female teachers report higher levels of self-perceived knowledge of teaching styles compared to their male counterparts, with the exception of the convergent discovery (G) and divergent discovery (H) teaching styles. Interestingly, these two styles are precisely those that place the greatest emphasis on student decision-making among the approaches examined. No statistically significant differences were found male and female internship teachers. These results are consistent with those observed in other research (Fernández-Rivas & Espada-Mateos, 2017; Parsak & Sarac, 2020; Salters & Benson, 2022; Zeng, 2016), which also found no statistically significant differences in teachers' perceptions and use of gender-based teaching styles.

This study also shows that there are no statistically significant differences in the manifest knowledge of teaching styles between male and female internship teachers, although women demonstrated greater actual knowledge of teaching styles that are more centered on teacher decisions, while men revealed greater knowledge of teaching styles in which student decisions predominate. These results are in line with those obtained in other studies, in which no significant differences were found depending on the

teacher's sex in relation to the degree of preparation, preference and use of teaching styles in their classes (Espada-Mateos & Pineño, 2020; Espada-Mateos & Canadas, 2022; Fernández-Rivas & Espada-Mateos, 2017; Ince & Hunuk, 2010; Merino-Barrero et al., 2017; Parsak & Sarac, 2020; Zeng, 2016).

Conclusions

The study allows us to conclude that the vast majority of internship teachers of Physical Education who participated in our study have a high degree of self-perceived knowledge of teaching styles across the spectrum, which decreases as we move from teacher-centered styles to student-centered styles. This self-assessed knowledge is higher in command (A) and practice (B) teaching styles and lower in convergent discovery (G) and divergent discovery (H) styles.

It was also found that internship teachers of Physical Education overestimate their knowledge of teaching styles, given that manifest knowledge evidence was lower than that reported for all teaching styles, although the trend of gradual decrease continues as we progress from reproduction styles to production styles. Manifest Knowledge is greater in command (A) and reciprocal (C) teaching styles and minor in convergent discovery (G) and divergent discovery (H) teaching styles. It is also concluded that there is an association between self-perceived and manifest knowledge in command (A), practice (B), reciprocal (C) and divergent discovery (H) teaching styles, in which greater self-perceived knowledge is associated with greater manifest knowledge.

It should also be noted that no statistically significant differences ($p > .05$) were found in either self-perceived or manifest knowledge of teaching styles between male and female internship teachers. However, the results suggest that female teachers reported higher levels of both self-perceived and manifest knowledge in styles belonging to the reproduction cluster, whereas male teachers demonstrated greater knowledge of styles within the production cluster.

Future studies should apply more reliable sampling procedures, as network or "snowball" sampling is a non-probabilistic method that may introduce some bias, depending on the participants' contact networks, and is therefore not the most suitable for statistically representative estimates of the population under study. Considering the curricular framework of teaching styles in initial training can broaden the interpretation of the data, which should be taken into account in future developments on this topic. Another limitation of this study is that the manifest knowledge assessed was merely theoretical, making it necessary to verify the practical manifest knowledge of teaching styles.

Based on the results of the current research, further studies, both quantitative and qualitative, are recommended to identify the reasons for the gaps found in the manifest knowledge of teaching styles, especially those belonging to the production group, at the end of initial teacher training. It is also necessary to understand how internship teachers of Physical Education use teaching styles and what teaching practices they actually use in their classes. It is also suggested that follow-up with the participants be considered, as well as exploring the perceptions of the respective students, in order to establish a convergence between teacher-student perceptions and examine their impact on learning outcomes.

Acknowledgements

Paulo Nobre: University of Coimbra, CIPER, Faculty of Sports Sciences and Physical Education, Portugal; University of Coimbra, Center for Interdisciplinary Studies (CEIS20, GRUPOEDE), Coimbra (Portugal)

We thank our colleagues from the Department of Physical Education at the Faculty of Sports Sciences and Physical Education of the University of Coimbra for their help in reviewing our questionnaire, as well as all the coordinators of the Master's programs in Physical Education Teaching in Elementary and Secondary Education from the universities of origin of the internship teachers participating in our research, to whom we extend our gratitude for their participation.

Financing

The authors received no financial support for the research, authorship and/or publication of this article.

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Authors' and translators' details:

Antero Filipe Rocha Abreu	anteroabreu@fcdef.uc.pt	Author
Paulo Renato Bernardes Nobre	prnobre@fcdef.uc.pt	Author
Paulo Renato Bernardes Nobre	prnobre@fcdef.uc.pt	Translator