




Article

Teaching Skills Assessment in Initial Teacher Training in Physical Education

José Luis Aparicio-Herguedas ^{1,*}, Jairo Rodríguez-Medina ²,
Juan Carlos González-Hernández ³ and Antonio Fraile-Aranda ³

¹ Faculty of Education, University of Valladolid, 40005 Segovia, Spain

² Faculty of Education, Universidad Nacional de Educación a Distancia (UNED), 28040 Madrid, Spain; jairodmed@edu.uned.es

³ Faculty of Education, University of Valladolid, 47011 Valladolid, Spain; juancarlos.gonzalez.hernandez@alumnos.uva.es (J.C.G.-H.); antonio.fraile@uva.es (A.F.-A.)

* Correspondence: joseluis.aparicio.herguedas@uva.es; Tel.: +34-342-3473

Received: 24 October 2020; Accepted: 16 November 2020; Published: 19 November 2020



Abstract: This paper assessed the impact of two teacher training degrees in Physical Education, one focusing on primary school teaching and the other one concerning secondary school teaching. Data from students of both degrees were statistically compared and contrasted taking into account four training scopes from the *Questionnaire of Perception of Teaching Skills in Physical Education*. A three-stage analysis was carried out: (i) a descriptive stage, (ii) an invariance analysis, and (iii) a comparison of latent means across the degrees. The results show significant statistical differences between the two degrees regarding the training impact on developing skills for physical and motor development basics, contents for learning, and physical activity promoting health; however, no statistically significant differences were found regarding the learning and teaching processes in Physical Education. Moreover, in both degrees, the training proved to be insufficient for developing the skill in inclusive education.

Keywords: initial teacher training; teaching skills assessment; program assessment; physical education

1. Introduction

After the creation of the European Higher Education Area (EHEA), new teacher training programs related to skill development were designed. In this regard, Spain created two new university degrees for the initial teacher training in Physical Education (ITTPE) in order to be more consistent with the existing European ones one was a Primary Education Teacher Degree (6–12 years old students), with a special focus on Physical Education (PETPE); the other degree was in Physical Activity and Sports Sciences (PASS) for 12–16-year-old students [1–3]. The first one prioritized training contents with a play-based approach, whereas the other was rooted in sport-oriented content. According to Palacios-Picos et al. [4], the first studies on ITTPE took a technocratic perspective derived from the competency-based teacher education model, which, in turn, prioritized skill development [5–9]. Consequently, it was deemed necessary to assess (i) to what extent the new teacher training programs were having an impact on future teachers' teaching skills and (ii) the differences between both degrees. This study is justified on the basis that its results and conclusions may contribute to the enhancement of similar programs, ones within the European context.

1.1. Training Scopes in Initial Teacher Training in Physical Education

According to Goodyear et al. and Zhang et al. [10,11], scopes of content included in ITTPE programs arise from the selection of subjects having conceptual and practical pedagogical applications,

incorporating bodies of knowledge (and parts thereof) from other academic traditions and trends. In this vein, four scopes of content were developed in these new degrees.

The first scope of content approached the implementation of educational practices [12] focused on diversity from an inclusion and equity point of view [7,13,14]. Taking this into account [15–17], such training highlighted the importance of specific teaching modules oriented toward didactic interventions associated with training assessment [18–21]. According to Alonso and Campos-Izquierdo et al. [6,22], although ITTPE has already this instrumental emphasis, more classroom inclusive practices ought to be encouraged [23–25] to shape teacher profiles in more sensitive ways toward groups with special needs [26–28].

The second scope of content was related to the knowledge and applicability of physical and motor development basics from perceptual-motor behaviors, including socially and culturally accepted movement practices [29–31]. According to Whittle et al. and Gambau-I Pinasa [32,33], this is necessary for teachers geared for primary school teaching (PETPE). Moreover, there were included certain physiological aspects that are relevant on account of their applicability to sports training in PASS [34], since they are related to the sport performance field [19,35,36].

The third scope of content included the initiation to games, body expression, and sport as the main theoretical-practical knowledge in ITTPE. The studies carried out by ANECA [1], Campos et al., and Bannister-Tyrrell et al. [37,38] highlighted the relevant training aspect of such didactic resources for PETPE. Also, in terms of sport pedagogy, the research carried out by Maulini and Maulini et al. [39,40] showed how much the students pursuing PASS valued the technical and tactical knowledge of sport disciplines for their teacher training. But, ITTPE did not consider relevant changes in their sports practices or methodologies [11,41,42]. Matzler, as well as Tinning [43,44], explained that because this orientation arises from the prevalence of socially-rooted sports and it lacks a critical view among prospective teachers. In view of this, both Mitchell et al. and Pill et al. [45,46] recommended a more comprehensive, complete, and fair model in sports pedagogy in order to achieve a more balanced view of this field. However, in terms of games and body expression, ITTPE adopted an aesthetic and socio-emotional approach to movement [47], which complements the traditional biological and androcentric view of PE [48–50]. The evolution of such physical-artistic-expressive contents is increasingly tending toward an engaging, communicative, and reflective development of the student [51–53]. The fourth and final scope of content focused on health, particularly on improving body hygiene, healthy habits, and personal wellness, following the World Health Organization's recommendations [54] regarding the need for developing healthy habits both inside and outside school, as an educational-cultural phenomenon [41]. Berger et al. [55] explained the increase in physical-sportive practice because of the psychophysical and social-affective approach [56]. In this vein, the research carried out by Gutiérrez et al. and Bannister-Tyrrell et al. [35,38] showed an appropriate teaching drive for developing skills related to physical activity, hygiene, and health in ITTPE. Finally, according to Webster et al. [57], it was deemed necessary to provide PASS students with more practical knowledge regarding the contribution of physical activity and quality of life in the fight against the increasing consumption of alcohol, tobacco, and other drugs within that teenage community [58,59].

1.2. Study Objectives

The general purpose of this study was to assess two teacher training degrees in Physical Education, one focusing on primary school teaching and the other one concerning secondary school teaching. From this, two specific objectives were established. The first one was to statistically compare and contrast data from students of both degrees in four training scopes: (i) the skill for managing teaching-learning processes; (ii) the skill for mastering the basics of physical and psychomotor development; (iii) the skill for managing physical activities and learning contents; and (iv) the skill for promoting body hygiene and healthy habits. The second specific objective was to find out any differences in the results of the two degree programs.

2. Materials and Methods

2.1. Participants

The sample was composed of 1149 university students (59.7% men and 40.29% women) from 20 university centers from 20 Spanish cities. Out of them, 780 (67.88%) were attending the fourth year of PETPE, whereas 369 (32.12%) were attending PASS.

2.2. Procedure

For the purposes of this study, and following the guidelines in the Spanish White Books, the Red Nacional de Evaluación Formativa en Educación Superior (Spanish National Network of Formative Assessment in Higher Education) designed a teaching skills questionnaire to be implemented in both PETPE and PASS degrees [1,2]. The first draft of the questionnaire was reviewed and analyzed by a panel of experts, who grouped, removed, and changed items in terms of content validity and reliability. Afterward, and after including all the suggestions, the second draft of the questionnaire was tested with a random sample of 85 students attending the last year of both degrees in four different universities. The statistical process followed to ensure validity and reliability is described below (see Section 2.3).

The final version of the *Questionnaire of Perception of Teaching Skills in Physical Education* [4] consisted of 22 items assigned to four subscales. The first subscale consisted of eight items on the organization, design, and planning. The second subscale consisted of eight items on the learning contents inherent to PE and organized physical activities. The third subscale referred to the methodology and included ten items. And lastly, the fourth subscale was made up of three items relating to the assessment. All the items referred to the students' perception of the *level of support received by the subjects* taken in both degrees and their contribution to the *development of the skills* acquired.

Furthermore, the ethical rigor was guaranteed as established by the Ethics Committee of the researchers' university. In addition, an informed consent form was signed by all participants who, in turn, were not only informed, verbally and in writing, about the purposes and the procedure of the study but also were ensured anonymity and that the data would exclusively be used for the purposes of the investigation.

2.3. Instruments

The *Questionnaire of Perception of Teaching Skills in Physical Education* [4], made up of four subscales with a total of 22 items, was developed and used. The questionnaire also reflected sociodemographic features: age, gender, location, and studies pursued. The respondents expressed their level of agreement for each of the statements on a Likert scale of five points (0 = Not at all and 4 = Extremely).

The process of reaching validity and reliability was as follows. The internal consistency of the four subscales and of the total score was verified using Cronbach's alpha coefficients for ordinal data and McDonald's omega. Overall, an ordinal alpha value of 0.95 and an omega value of 0.91 were obtained. Both values were considered excellent. Regarding the first subscale, relative to organization, design, and planning, good internal consistency indices were obtained ($\alpha = 0.87$, $\omega = 0.87$). Regarding the second subscale, relative to the contents, adequate reliability indices were obtained as well ($\alpha = 0.84$, $\omega = 0.86$). Similarly, good internal consistency indices were shown for both the third subscale, relative to the methodology ($\alpha = 0.86$, $\omega = 0.86$), and the fourth scale, related to evaluation ($\alpha = 0.76$, $\omega = 0.75$). Finally, the factorial structure proposed for the questionnaire was ratified, and the fit indices were considered adequate (RMSEA = 0.052, 95% CI [0.048–0.056], CFI = 0.975, p (RMSEA < 0.05 = 0.239)).

2.4. Data Analysis

The data analysis process took place in three stages. Firstly, the descriptive analysis of the data set considered whether it was appropriate to compare subgroups taking into account the results of this tool and the measurement invariance based on the degree. Secondly, this was tested in four increasingly restrictive models for the first- and second-level factors: configural invariance

(equivalence of the number of factors); metric or weak invariance (equivalence of factor loadings); scalar or strong invariance (equivalence of thresholds); and strict invariance (equivalence of item residuals). Finally, after verifying the scale's factorial invariance, differences in latent means across groups were analyzed. To this end, they were fixed to zero for the PETPE student group (G1) and freely estimated for the PASS student group (G2).

3. Results

Firstly, a descriptive analysis of the data set and comparison across both groups was compiled. As for the skills related to the *teaching-learning processes in PE*, the differences across groups were few. The skill for *preparing and implementing PE programmes aimed at promoting the effective inclusion of pupils with special educational needs (SEN)* (item 1.2) was highlighted, although both groups stated that the subjects taken were the least helpful in developing such skill (*Not at all or Slightly* 34% in G1 (PETPE); *Not at all or Slightly* 28% in G2 (PASS)). Table 1 shows the percentages for the answer options selected by both groups. All the differences between groups—for the different answer options—were lower than 5% but for three. Particularly, the differences are 5% higher for item 1.2 (G1 = 37.37%, G2 = 44.35%, diff. = 7.08%), for item 1.14 (G1 = 35.96%, G2 = 29.75%, diff. = 6.21%), and for item 1.17 (G1 = 39.5%, G2 = 34.44%, diff. = 5.06%), all of them showing the neutral answer option *Moderately*. After checking the homogeneity of the variances using the Levene test, the differences between groups were analyzed using the Mann–Whitney–Wilcoxon tests. The results indicate that none of the differences were statistically significant.

Table 1. Percentages for the answer options selected for Factor 1 by Groups 1 and 2.

Item	% Not At All		% Slightly		% Moderately		% A Lot		% Extremely		% 0–1		% 3–4		M(Sd)			
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2		
1.1	1.44	1.1	9.97	12.4	40.29	42.42	42.26	37.47	6.04	6.61	11.42	13.5	48.29	44.08	3.41	(0.80)	3.36	(0.82)
1.2	5.64	3.03	28.48	25.34	37.27	44.35	24.15	24.79	4.46	2.48	34.12	28.37	28.61	27.27	2.93	(0.96)	2.98	(0.85)
1.3	1.31	0.28	12.47	12.12	45.54	43.8	36.09	38.29	4.59	5.51	13.78	12.4	40.68	43.8	3.30	(0.79)	3.36	(0.77)
1.14	1.71	3.58	14.3	13.5	35.96	29.75	37.4	37.74	10.63	15.43	16.01	17.08	48.03	53.17	3.40	(0.91)	3.47	(1.02)
1.16	2.89	2.2	18.9	14.88	35.04	39.67	34.91	34.71	8.27	8.54	21.78	17.08	43.18	43.25	3.26	(0.95)	3.32	(0.90)
1.17	0.52	1.93	10.63	12.4	39.5	34.44	39.76	38.84	9.58	12.4	11.15	14.33	49.34	51.24	3.47	(0.82)	3.47	(0.92)
1.19	1.05	1.38	11.29	11.02	42.13	45.45	37.93	34.99	7.61	7.16	12.34	12.4	45.54	42.15	3.39	(0.82)	3.35	(0.82)
1.20	0.92	0.83	13.78	14.6	43.7	41.6	35.3	35.54	6.3	7.44	14.7	15.43	41.6	42.98	3.32	(0.82)	3.34	(0.84)

In addition to the skill for the inclusion of students with special needs, a relevant percentage of participants from both degrees considered that the subjects taken contributed little or nothing to developing their skill for *responding to diversity in PE practices* (item 1.16) (*Not at all or Slightly* 21.78% for G1, 17.08% for G2).

Table 2 shows percentages for the answer options selected by both groups for the items related to Factor 2—the skills on *physical and motor development basics*. As shown, significant differences for all items were identified but for item 1.4 (*Knowing and promoting the different motor expressions as part of your traditional culture*).

Table 2. Percentages for the answer options selected for Factor 2 by Groups 1 and 2.

Item	% Not at All		% Slightly		% Moderat.		% A Lot		% Extremely		% 0–1		% 3–4		M(Sd)			
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2		
1.4	1.16	1.91	13	14.44	39.64	39.78	39.77	38.96	6.44	4.9	14.16	16.35	46.2	43.87	2.37	(0.832)	2.30	(0.845)
1.5	0.39	1.63	9.65	16.35	33.85	39.51	43.63	37.06	12.48	5.45	10.04	17.98	56.11	42.51	2.58	(0.842)	2.28	(0.859)
1.6	0.26	0.82	10.17	6.54	40.41	34.06	41.06	50.41	8.11	8.17	10.42	7.36	49.16	58.58	2.46	(0.794)	2.58	(0.766)
1.7	1.67	1.36	13.51	3.81	36.42	26.16	39.12	49.59	9.27	19.07	15.19	5.18	48.39	68.66	2.40	(0.893)	2.81	(0.833)
1.18	0.39	1.91	10.94	15.8	39.77	42.51	40.54	34.6	8.37	5.18	11.33	17.71	48.91	39.78	2.45	(0.811)	2.25	(0.851)

The Mann–Whitney–Wilcoxon tests indicated that PETPE students perceived that the subjects taken had contributed to developing the competency to know psychomotor development (item 1.5) (Mdn = 3) to a greater extent than PASS students (Mdn = 2) ($Z = 5.26, p < 0.001, r = 0.16$). In the same way, PETPE students also considered that the subjects taken had contributed to developing the competency to know and understand the bodily and motor evolutionary processes (item 1.18) to a significantly higher degree than PASS students ($Z = 3.59, p < 0.001, r = 0.11$). On the contrary, PASS students considered that the subjects taken had contributed to developing the competencies to know the physical capacities and the factors that determine their evolution, to know how to apply their specific technical foundations (item 1.6) (Md = 3), and to know the biological and physiological foundations of the human body in relation to physical activity (item 1.7) (Md = 3) to a significantly higher degree than PETPE students (item 1.6, Md = 2, $Z = 2.71, p < 0.001, r = 0.08$) (item 1.7, Md = 2, $Z = 7.29, p < 0.001, r = 0.21$). There were no significant differences between the two groups with regard to the competency to know and promote the different motor manifestations that are part of one's traditional culture (item 1.4, $Z = 1.11, p = 0.263, r = 0.03$).

As for Factor 3—on the skills related to the *contents of learning and physical activities*—most of the students from both degrees considered that the subjects taken in their respective degrees helped them *a lot* or *extremely* to develop skills aimed at knowing how to use play as a didactic resource and learning content (item 1.12) and to understand the basics of school sport initiation and to design specific tasks to use in the field of education (item 1.9).

The greatest differences between the groups in Factor 3 were identified in item 1.8 (*understanding the elements and basics of body expression and non-verbal communication and their training and cultural value*). In this regard, for most of the PETPE students (57.29%) the subjects taken helped them *a lot* or *extremely* to develop such skill, while just 37% of PASS students experienced that. Table 3 presents this item (1.8) showing the greatest differences between the groups.

Table 3. Percentages for the answer options selected for Factor 3 by Groups 1 and 2.

Item	% Not at All		% Slightly		% Moderat.		% A Lot		% Extremely		% 0–1		% 3–4		M(Sd)			
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2		
1.8	1.42	4.93	7.74	17.81	33.55	40.27	41.81	30.14	15.48	6.85	9.16	22.74	57.29	36.99	2.62	0.886	2.16	0.962
1.9	0.39	2.19	5.81	11.51	32.9	31.23	45.42	42.19	15.48	12.88	6.19	13.7	60.9	55.07	2.69	0.812	2.52	0.933
1.12	0.26	0.27	2.19	4.11	18.06	21.64	44.65	53.97	34.84	20	2.45	4.38	79.48	73.97	3.11	0.792	2.89	0.771
1.13	3.23	1.37	12.77	12.05	29.03	41.1	38.71	35.62	16.26	9.86	16	13.42	54.97	45.48	2.52	1012	2.40	0.873
1.15	2.06	1.92	13.81	13.15	37.81	37.26	33.81	37.53	12.52	10.14	15.87	15.07	46.32	47.67	2.40	0.945	2.40	0.908

To check whether these differences were statistically significant, the Mann–Whitney–Wilcoxon tests were applied again. The results of these tests indicate that the differences between groups are statistically significant at the 95% confidence level in item 1.8 (MdG1 = 3, MdG2 = 2, $Z = 7.54, p < 0.001, r = 0.022$), item 1.9 (MdG1 = 3, MdG2 = 3, $Z = 2.67, p = 0.007, r = 0.079$), item 1.12 (MdG1 = 3, MdG2 = 3, $Z = 4.61, p < 0.001, r = 0.137$), and item 1.13 (MdG1 = 3, MdG2 = 2, $Z = 2.45, p = 0.014, r = 0.073$). The differences in item 1.15 were not statistically significant (MdG1 = 2, MdG2 = 2, $Z = 0.08, p = 0.931, r = 0.002$).

As for Factor 4—on the skills related to *body hygiene and healthy habits*—the greatest differences between the groups were in *identifying and preventing health risks arising from practising inappropriate physical activities* (item 1.22). Table 4 shows the different answers provided by both groups. The greatest differences between the groups were in items 1.21 and 1.22. The differences in skills for *having strategies for implementing health elements on hygiene and nutrition for the educational practice* (item 1.10) and *having teaching strategies promoting the acquisition of regular physical activity habits* (item 1.11) were lower than 6%, and they only took place in two categories.

Table 4. Percentages for the answer options selected for Factor 4 by Groups 1 and 2.

Item	% 0		% 1		% N		% 3		% 4		% 0 to 1		% 3 to 4		M(Sd)			
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2		
1.10	4.42	4.42	16.12	20.99	32.77	33.7	36.93	32.87	9.75	8.01	20.55	25.41	46.68	40.88	2.31	(0.999)	2.19	(1.00)
1.11	1.69	0.55	10.92	8.29	34.72	39.78	40.44	41.16	12.22	10.22	12.61	8.84	52.67	51.38	2.50	(0.902)	2.52	(0.809)
1.21	0.26	1.1	9.1	5.25	38.75	30.94	41.74	46.41	10.14	16.3	9.36	6.35	51.89	62.71	2.52	(0.806)	2.71	(0.838)
1.22	2.6	0.28	14.43	6.35	33.42	30.66	40.18	48.34	9.36	14.36	17.04	6.63	49.54	62.71	2.39	(0.933)	2.70	(0.801)

The results of the Mann–Whitney–Wilcoxon tests indicate that the differences between groups are statistically significant at the 95% confidence level in item 1.10 (MdG1 = 2, MdG2 = 2, $Z = 2.05$, $p = 0.039$, $r = 0.061$), item 1.21 (MdG1 = 3, MdG2 = 3, $Z = 3.86$, $p < 0.001$, $r = 0.115$), and item 1.22 (MdG1 = 3, MdG2 = 3, $Z = 5.06$, $p < 0.001$, $r = 0.15$). The differences in item 1.11 were not statistically significant (MdG1 = 3, MdG2 = 3, $Z = 0.04$, $p = 0.964$, $r = 0.001$).

These results show that PASS students considered that the subjects taken for their degree had been more helpful for developing skills for *body hygiene and healthy habits* than the subjects taken by PETPE students. However, in regard to *having strategies for implementing health elements on hygiene and nutrition for the educational practice* (item 1.10), PETPE students considered that the subjects taken had contributed slightly more than the perception provided by PASS students.

3.1. Factorial Invariance between Degrees

In order to assess whether the second-order model suggested by Palacios-Picos et al. [4] was kept invariant between degrees, a series of nested models were presented. Firstly, there was a configural invariance model where factorial loadings, intercepts, regression coefficients (second-order factorial loadings), intercepts of first-order factors, and second-order factor means were freely estimated between the groups. Four nested models were then sequentially specified where the factorial loadings, thresholds, means, and error terms were established across the groups. As per recommendations of Chen and Cheung et al. [60,61], increments lower than 0.010 in CFI and TLI and decreases lower than 0.015 in RMSEA suggest there are no relevant changes in fitting the model with respect to the more restrictive following one or in establishing the relevance of the fitting differences between the models.

Indexes showed an adequate fit to the configural invariance model ($\chi^2(410) = 1046.799$, $p < 0.001$; CFI = 0.975; RMSEA = 0.052, 95% CI [0.048–0.056], p (RMSEA < 0.05 = 0.239)), supporting the assumption that these items account for the same underlying construct for both groups. It can therefore be concluded that both the number of factors and the factorial loadings pattern of the items are similar for both groups. Table 5 shows the information on the goodness-of-fit for each model and the comparison between models.

In order to check the invariance second-order model (metric invariance), the previous model was compared against the factorial loadings invariance model. In this case, non-significant decreases in three of the four fit indices were found (Δ CFI = -0.009 ; Δ TLI = 0.005; Δ RMSEA = 0.007; Δ SRMR = 0). Such evidence—the metric invariance—showed that the contribution of each item to the latent variables remained steady for the different groups, and therefore it allowed to compare the groups with respect to the variances and covariances of the latent variances, being appropriate to proceed with a scalar invariance test. To that end, the factorial loadings invariance model (Model 6) was compared against the threshold invariance model (Model 5). The scalar invariance allowed comparisons between group means and, as showed in Table 5, the strong invariance model (Model 6) did not significantly worsen the immediately prior less restrictive model fit (Model 5).

Table 5. Invariance model fit.

Invariance Model	χ^2			RMSEA		SRMR	CFI	TLI	Δ CFI	Δ TLI	Δ RMSEA	Δ SRMR
	Value	df	p	Value	90% CI							
Configural	1046.799	410	0	0.052	[0.048–0.056]	0.239	0.975	0.972	-	-	-	-
Model 2	1047.656	428	0	0.050	[0.046–0.054]	0.519	0.976	0.974	0.001	0.002	-0.002	0.005
Model 3	1037.031	431	0	0.049	[0.045–0.053]	0.640	0.976	0.975	0.001	0.001	-0.001	0.001
Model 4	1326.754	471	0	0.056	[0.052–0.059]	0.003	0.967	0.967	-0.009	-0.005	0.007	0
Model 5	1473.130	492	0	0.059	[0.055–0.062]	0.001	0.962	0.964	-0.005	-0.003	0.003	0.001
Model 6	1433.863	497	0	0.057	[0.053–0.060]	0.001	0.963	0.966	0.002	0.002	-0.002	0.001
Model 7	1302.690	519	0	0.051	[0.047–0.054]	0.327	0.969	0.973	0.006	0.007	-0.006	0.005

Note. CFI = comparative fit index; df = degrees of freedom; RMSEA = root mean squared error of approximation; SRMR = standardized root mean residual; TLI = Tucker–Lewis index; CI = confidence interval.

Finally, the strict invariance model (Model 7) compared the null hypothesis that the error variances of each item were equal for both groups. In this case, the differences across the groups in the variances considered were attributable to the differences in latent common factors. Therefore, such differences between groups for the evident variables were the result of differences in latent factors. Again, as shown in Table 5, this model did not significantly worsen the fit compared against the less restrictive previous model (Model 6).

3.2. Latent Means Comparison

Comparing the measurement tool's strict invariance for both groups allowed comparing the differences in the latent means across these groups. In order to verify the latent means differences for the four first-order factors, the first-order factors' saturations (except for the ones established in 1.0) were equalized for both groups so that the latent means for the first-order factors were set to zero for G1 and were estimated for G2. In addition, the second-order factor's saturations were estimated for both groups. As shown in Table 6, no significant differences were found regarding Factor 1 (*Teaching-learning processes in PE*) ($z = 0.349$; $p = 0.727$; $d = 0.071$).

Table 6. Differences in latent means.

Factor	χ^2			RMSEA		SRMR	CFI	Δ CFI	est	z Value	p	Effect Size
	Value	df	p	Value	90% CI							
First-order equal means	1361.724	520	0	0.053	[0.049–0.056]	0.094	0.967	-	-	-	-	-
F1									0.021	0.349	0.727	0.071
F2									-0.045	-0.759	0.448	0.107
F3	1366.415	516	0	0.053	[0.050–0.057]	.062	0.967	0	-0.236	-4.734	<0.001	1.92
F4									0.141	2.125	0.034	0.26
Second-order equal means	1261.851	524	0	0.049	[0.046–0.053]	0.649	0.971	-	-	-	-	-
FG	1309.704	523	0	0.051	[0.047–0.054]	0.343	0.969	-0.002	-0.046	-0.839	0.401	-0.056

Note. CFI = comparative fit index; df = degrees of freedom; RMSEA = root mean squared error of approximation; SRMR = standardized root mean residual; TLI = Tucker–Lewis index; CI = confidence interval.

As for Factor 2 (*Physical and motor development basics*), there were no significant differences either ($z = -0.759$; $p = 0.448$; $d = -0.107$). In this case, PETPE students considered the subjects had helped them to develop such skills slightly greater than PASS students. However, those differences were not statistically relevant.

As for Factor 3 (*Learning contents and physical activities*), PETPE students considered the subjects taken helped them to develop this type of skills greater than PASS students ($z = -4.734$; $p < 0.001$; $d = 1.92$; $d = 1.92$). Likewise, significant differences were identified in the latent mean related to Factor 4 (*Body hygiene and healthy habits*). In this case, the rating for PASS students was higher than the PETPE

students' one ($z = 2.125$; $p = 0.034$; $d = 0.26$). Again, such a difference reflected the results achieved in the data descriptive analysis.

As for the second-order factor (*Teaching skills specific to PE teachers*), the results of the latent means comparisons did not show significant differences between the students of both groups ($z = -0.839$; $p = 0.401$; $d = 0.056$).

4. Discussion

With the creation of the EHEA, teaching and transversal competencies programs (ITTPEs) have been developed in Spain. This implies a change in the design of the purposes of these studies that obviously affects the rest of the programming elements. In the same way, a greater differentiation is created between the profile and training that primary education teachers receive through the PETPE degree and secondary education teaching through the PASS degree. In view of this, it was deemed necessary to analyze the assessment made by university students in Physical Education teaching, regarding the impact of their respective degrees on the development of their teaching skills in four main content scopes: (i) manage the teaching-learning processes; (ii) support physical and psychomotor development; (iii) manage physical activities and learning content; and (iv) promote body hygiene and healthy habits.

There was evidence that the four factors analyzed were invariant for both groups. The invariance level achieved allowed for significant comparison of the estimated latent means between both groups, since the differences in the variables observed were the result of differences in common latent factors, instead of differences in the understanding of items, the scale structure, or other external factors. There were no statistically significant differences between the groups observed regarding the impact of the subjects structured in Factor 1—training contributing to the development of skills in managing the teaching-learning processes in PE. Both groups considered that the subjects taken helped them a lot in developing skills related to the design and implementation of didactic interventions and assessment, which are vital aspects for managing such contents [15–17], and similarly with students from both degrees [6,22]. However, there was a training shortcoming observed in developing skills for addressing inclusion and diversity by PE, which both groups valued as *slightly* or *not at all* trained. Such shortcoming was also assessed in the studies carried out by Hutzler et al., McGrath et al., and Qi et al. [23–25] and, as such, needs to be better addressed in ITTPE through inclusive training experiences [26–28]. Regarding Factor 2, there were significant differences between the groups toward the PASS degree, since it addressed the need for mastering and managing the evolutive and psychomotor development processes of pupils [1]. In addition, Whittle et al. and Gambau-I Pinasa [32,33] acknowledged such training assurance in ITTPE. For PASS students, unlike for the PETPE ones, the mastering of skills related to the understanding of human body biological and physiological basics related to the physical activity and the understanding of the physical capacities was evident; the need for that knowledge and the focus on it is presumed adequate in order to develop them in teaching secondary education effectively—the teaching context for PASS graduates [2,19,35,62]. As for Factor 3—learning contents and physical activities—both groups considered *a lot* the training support received for learning how to use play as a didactic resource and teaching content, as well as for understanding the basics of school sport initiation. There were some slightly higher valuations in PETPE because of its exclusive pedagogic approach to the profile and the focus on play and initiation sport as pedagogic resources, using them to address technical and tactical aspects for the sports instruction [37,38,40]. Nevertheless, according to some scholars, sport must be also considered in ITTPE from a socio-critical and equitable perspective [45] in order to compensate for the prevalent competitive sport model reigning in sports federations and fostered on social media [43,46,63]. The training shortcoming for this scope can be seen, as well, in the limited impact of the subjects taken in PASS for developing the skill for body expression, non-verbal communication, and its cultural training value, which is unable to offset the PE traditional hygienist and biological load [48–50] with its aesthetical, expressive, and emotional nature [47,51–53].

Finally, there seems to be a greater impact of subjects from Factor 4 relating to body hygiene and healthy habits on PASS students, when compared to PETPE students' perspectives regarding their training received for developing the skills to analyze and communicate, in a critical and substantiated way, the value of the physical activity and sport, as well as its opportunities to support the development and wellbeing and to identify and prevent health risks from inappropriate physical activities. Gutiérrez et al. [35] agreed that the training for theoretical-practical knowledge in PASS for this type of skill targeting health, risks prevention, and quality of life is sufficient [1]. However, there is an ongoing, and perhaps increasing, need for better training for future PE teachers [57] due to the social relevance these aspects have not only in preventing the use of alcohol, tobacco, and other drugs among teenagers but also for creating comprehensive educational atmospheres where physical activity habits and healthy lifestyles are encouraged [58,59].

5. Conclusions

The evaluation of the initial teacher training programs in Physical Education allows one to explore the real impact of the training given to future Physical Education teachers and, consequently, address current socio-educational challenges. Among the contributions made in the present study, it is possible to recognize the value of the two degrees that train physical educators in Spain, considering the two particular contexts of primary school education and secondary education.

The mastery of certain competencies necessary to face present challenges in both educational contexts, such as those related to educational inclusion and attention to students with special needs, as well as the development of more equitable and socially-conscious perspectives, need to be developed further if one wishes to foster teacher profiles committed to sustainable, responsible, and pro-active social change. This key challenge requires motivating future teachers at both levels to discover and to create diverse, multicultural, functional, and tolerant educational environments.

In the same way, it is clear the necessity to recognize the importance of non-hegemonic bodily practices, such as bodily expression, to reinforce values such as self-knowledge, cooperation, and a greater awareness of non-competitive practices as resources for the formation of a school model that is tolerant, diverse, and alternative. Finally, it is necessary to strengthen the training of prospective PE teachers focused on healthy habits of physical activity and sustainable and balanced lifestyles.

Author Contributions: Conceptualization, J.L.A.-H., J.R.-M., J.C.G.-H., and A.F.-A.; methodology, J.L.A.-H., and J.R.-M.; validation, J.L.A.-H., J.R.-M., J.C.G.-H., and A.F.-A.; formal analysis, J.R.-M.; investigation, J.L.A.-H., J.C.G.-H., and A.F.-A.; data curation, J.L.A.-H., and J.R.-M.; writing—original draft preparation, J.L.A.-H., J.R.-M., J.C.G.-H., and A.F.-A.; writing—review and editing, J.L.A.-H., J.R.-M., J.C.G.-H., and A.F.-A.; project administration, J.L.A.-H. and A.F.-A.; funding acquisition, J.L.A.-H. and A.F.-A. All authors have read and agreed to the published version of the manuscript.

Funding: This study was funded by Research Project RTI2018-093292-B-I00: "Evaluación de competencias en los Trabajos fin de Estudios (Grado y Máster) en la formación inicial del profesorado de Educación Física." Programa Estatal de I+D+i orientado a los Retos de la sociedad en el marco del Plan Estatal de Investigación Científica y Técnica y de Innovación 2017-2020. BOE 201, 20/8/2018.

Acknowledgments: The authors wish to express their gratitude in a special way to Juan Miguel Fernández Balboa for the excellent contributions made to improve this article.

Conflicts of Interest: The authors declare no conflict of interest

References

1. Agencia Nacional de la Evaluación de la Calidad y la Acreditación. *Libro Blanco: Título de Grado en Magisterio*; ANECA: Madrid, Spain, 2005.
2. Agencia Nacional de la Evaluación de la Calidad y la Acreditación. *Libro Blanco: Título de Grado en Ciencias de la Actividad Física y el Deporte*; ANECA: Madrid, Spain, 2005.
3. Díaz-Méndez, M.; Gummesson, E. Value Co-Creation and University Teaching Quality. *J. Serv. Manag.* **2012**, *23*, 571–592. [[CrossRef](#)]

4. Palacios-Picos, A.; López-Pastor, V.M.; Fraile-Aranda, A. Cuestionario de Percepción De Competencias Docentes de Educación Física. *Rev. Int. Med. Cienc. Act. Física Deporte* **2019**, *19*, 445–461. [[CrossRef](#)]
5. Baena-Extremera, A.; Granero Gallegos, A. Competencias Profesionales En Educación Física y Necesidades Educativas. *Espiral Cuad. Profr.* **2012**, *5*, 105–109. [[CrossRef](#)]
6. Campos-Izquierdo, A.; Martín-Acero, R. Percepción de las competencias profesionales de los graduados en Ciencias de la Actividad Física y del Deporte. *Rev. Psicol. Deporte* **2016**, *25*, 339–346.
7. Díaz del Cueto, M. Percepción de competencia del profesorado de educación física e inclusión. *Rev. Int. Med. Cienc. Act. Física Deporte* **2009**, *9*, 322–348.
8. Gallego-Ortega, J.L.; Rodríguez-Fuentes, A. Perceptions of Teachers About Communicative Competences of The Future Physical Education Teachers. *Rev. Int. Med. Cienc. Act. Física Deporte* **2018**, *18*, 479–492.
9. Hernández, J.L. El nuevo modelo de maestro. Competencias de la Mención de Educación Física. In *Educación Física en el Siglo XXI*; Palou, P., Ponseti, F.J., Borrás, P.A., Vidal, J., Eds.; Universitat de les Illes Balears: Balearic Islands, Spain, 2007; pp. 163–183.
10. Googyear, V.A.; Cashey, A.; Kirk, D. Practice architectures and sustainable curriculum renewar. *J. Curric. Studies* **2017**, *49*, 235–254.
11. Zhang, T.; Wang, Y.; Yli-Piipari, S.; Cheng, A. Power of the curriculum: Content, context, and learning in physical education. *Res. Q. Exerc. Sport* **2019**, *1*, 1–12.
12. Davis, L. Faculty Beliefs Concerning the Preparation of Physical Education Teacher Education Students for Appropriate Practices. *Phys. Educ.* **2020**, *77*, 42–58. [[CrossRef](#)]
13. Lleixà, T.; Torralba, M.A.; Abrahão, S.R. Evaluación de competencias en educación física: Investigación-acción para el diseño de procedimientos de evaluación en la etapa primaria. *Movimento* **2010**, *6*, 33–51. [[CrossRef](#)]
14. Mendoza, N. La formación del profesorado en educación física con relación a las personas con discapacidad. *Ágora EF Deporte* **2009**, *9*, 43–56. [[CrossRef](#)]
15. Heikinaro-Johansson, P.; Hasanen, E.; Mcevoy, E.; Lyyra, N. Preparing Physical and Health Education Pre-Service Teachers to Support Students’ Physical Activity and Wellbeing during the School Day. *Curric. Stud. Health Phys. Educ.* **2017**, *9*, 43–57. [[CrossRef](#)]
16. Grossman, P.; Schneider Kavanagh, S.; Pupik Dean, C.G. The turn towards practice-based teacher education: Introduction to the work of the Core Practice Consortium. In *Teaching Core Practices in Teacher Education*; Grossman, P., Ed.; Harvard Education Press: Cambridge, MA, USA, 2018; pp. 1–15.
17. Webster, C.A.; Russ, L.; Webster, L.; Molina, S.; Lee, H.S.; Cribbs, J. PETE Faculty Beliefs Concerning the Preparation of Preservice Teachers for CSPAP Roles: An Exploratory Study. *Phys. Educ.* **2016**, *73*, 315–319.
18. Booth, T.; Ainscow, M. *Index for Inclusion: Developing Learning and Participation in Schools*; CSIE: Bristol, UK, 2002.
19. Cañadas, L.; Santos-Pastor, M.L.; Castejón, J. Competencias docentes en la formación inicial del profesorado de educación física. *Retos* **2019**, *35*, 284–288.
20. Hortigüela, D.; Palacios, A.; López-Pastor, V.M. The impact of formative and shared or coassessment on the acquisition of transversal competences in higher education. *Assess. Evaluation High. Educ.* **2018**, *43*, 1–14.
21. López-Pastor, V.M.; Sicilia-Camacho, A. Formative and shared assessment in higher education. Lessons learned and challenges for the future. *Assess. Evaluation High. Educ.* **2017**, *42*, 77–97. [[CrossRef](#)]
22. Alonso, P. Competences Training of the Teacher’s Training in Physical Education. *Educar* **2018**, *42*, 63–77. [[CrossRef](#)]
23. Hutzler, Y.; Meier, S.; Reuker, S.; Zitomer, M. Attitudes and Self-Efficacy of Physical Education Teachers toward Inclusion of Children with Disabilities: A Narrative Review of International Literature. *Phys. Educ. Sport Pedagog.* **2019**, *24*, 49–66. [[CrossRef](#)]
24. Mcgrath, O.; Crawford, S.; O’Sullivan, D. ‘It’s a Challenge’: Post Primary Physical Education Teachers’ Experiences of and Perspectives on Inclusive Practice with Students with Disabilities. *Eur. J. Adapt. Phys. Act.* **2019**, *12*, 2–14. [[CrossRef](#)]
25. Qi, J.; Wang, L.; Ha, A. Perceptions of Hong Kong Physical Education Teachers on the Inclusion of Students with Disabilities. *Asia Pac. J. Educ.* **2016**, *37*, 86–102. [[CrossRef](#)]
26. Lleixà, T.; Ríos, M. Formación del profesorado en educación física e inclusión del alumnado con pluridiscapacidad. *Rev. Int. Form. Profr.* **2020**, *34*, 49–68.
27. Ring, E.; O’Sullivan, L. Creating Spaces Where Diversity Is the Norm: An Innovative Competency-Based Blended Learning Teacher Education Program in Ireland. *Child. Educ.* **2019**, *95*, 29–39. [[CrossRef](#)]

28. Wyant, J.D.; Killick, L.; Bowen, K. Intercultural Competence: Physical Education Teacher Education Recommendations. *Quest* **2018**, *7*, 416–433. [[CrossRef](#)]
29. McLachlan, C.; Fleer, M.; Edwards, S. *Early Childhood Curriculum: Planning, Assessment and Implementation*; Cambridge University: Melbourne, Australia, 2013.
30. Zhang, T.; Solmon, M.A. Integrating self-determination theory with the social ecological model to understand students' physical activity behaviors. *Int. Rev. Sport Exerc. Psychol.* **2013**, *6*, 54–76. [[CrossRef](#)]
31. Larrey, L.; López García, G.M.; Mozos Pernía, A.; López Baena, G. *Desarrollo Cognitivo y Motor*; McGraw-Hill: Barcelona, Spain, 2013.
32. Whittle, R.J.; Telford, A.; Benson, A.C. Teacher's perceptions of how they influence student academic performance in VCE physical education. *Aust. J. Teach. Educ.* **2018**, *43*, 1–25. [[CrossRef](#)]
33. Gambau i Pinasa, V. Las problemáticas actuales de la educación física y el deporte escolar en España. *Rev. Española Educ. Física Deportes* **2015**, *41*, 53–69.
34. McArdle, W.D.; Katch, F.L.; Katch, V.L. *Fisiología del Ejercicio*; McGraw-Hill: Madrid, Spain, 2016.
35. Gutiérrez, C.; Hortigüela, D.; Peral, Z.; Pérez-Pueyo, A. Percepciones de Alumnos del Grado en Maestro en Educación Primaria con Mención en Educación Física sobre la Adquisición de Competencias. *Estud. Pedagógicos* **2018**, *54*, 223–239. [[CrossRef](#)]
36. Fernández Balboa, J.M. Prospective physical educators' perspectives on school micropolitics. *J. Sport Pedagog.* **2000**, *6*, 1–33.
37. Campos, M.C.; Ries, F.; Del Castillo, O. Análisis De Las Competencias Adquiridas y Utilizadas Por Los Egresados Maestros En Educación Física. *RICYDE* **2011**, *7*, 216–229.
38. Bannister-Tyrrell, M.L.; Mavropoulos, S.; Jones, M.; Bayley, J.; O'Donnell-Ostini, A.; Dorji, R. Initial teacher preparation for teaching students with exceptionalities: Pre-service teachers' knowledge and perceived competence. *Aust. J. Teach. Educ.* **2018**, *43*, 19–34. [[CrossRef](#)]
39. Maulini, C. L'allenatore-educatore nel positive youth development. In *Pedagogia dell'Allenamento*; Isidori, E., Ed.; Edizioni Nuova Cultura: Rome, Italy, 2012; pp. 187–206.
40. Maulini, C.; Fraile-Aranda, A.; Cano, R. Competencias y Formación Universitaria Del Educador Deportivo En Italia. *Estud. Pedagógicos* **2015**, *41*, 167–182. [[CrossRef](#)]
41. Fraile-Aranda, A. *Actividad Física y Salud en Educación Primaria*; Junta de Castilla y León: Valladolid, Spain, 2004.
42. Fraile-Aranda, A.; Hernández-Álvarez, J.L. *Didáctica de la Educación Física: Una Perspectiva Crítica y Transversal*; Biblioteca Nueva: Madrid, Spain, 2004.
43. Metzler, M.W. *Instructional Models for Physical Education*; Routledge: London, UK, 2017.
44. Tinning, R. Theoretical orientations in physical education teacher education. In *The Handbook of Physical Education*; Kirk, D., McDonald, D., O'Sullivan, M., Eds.; Sage: London, UK, 2006; pp. 369–385.
45. Mitchell, S.A.; Griffin, L.L. *Teaching Sport Concepts and Skills. A Tactical Games Approach*; Human Kinetics: Champaign, IL, USA, 2006.
46. Pill, S.; Williams, J. Pursuing physical education outcomes through Sport Education. *Act. Healthy J.* **2019**, *2*, 11–14.
47. Mateu, M.; Coelho, M.A. La lógica interna y los dominios de acción motriz de las situaciones motrices de expresión (SME). *Emancipação* **2011**, *11*, 129–142.
48. Hristovski, R.; Aceski, A.; Balagué, N.; Seifert, L.; Tufekievski, A.; Aguirre, C. Structure and Dynamics of European Sports Science Textual Contents: Analysis of ECSS Abstracts (1996–2014). *Eur. J. Sport Sci.* **2016**, *17*, 19–29. [[CrossRef](#)]
49. Dobrescu, T.; Damian, M. Study on students' perception in the final year regarding the role played by the discipline: Corporal expression and eurhythmia. *Sci. Mov. Health* **2017**, *17*, 103–107.
50. Romero-Marín, M.R. *Expresión Corporal En Educación Física*; Prensas de la Universidad de Zaragoza: Zaragoza, Spain, 2015.
51. Carnero-Sierra, S.; Pérez De Amézaga, A.M. La Expresión Corporal Como Forma De Comunicación Esencial. *Holos* **2019**, *5*, 1–13. [[CrossRef](#)]
52. Davis, L. ComPETence in Educational Gymnastics: Shaping PETE Students' Attitudes. *J. Phys. Educ. Recreat. Dance* **2018**, *89*, 41–46. [[CrossRef](#)]
53. Fraile-Aranda, A.; Aparicio, J.L. Las competencias interpersonales que deben estar presentes en la formación inicial del profesorado de educación física. *Acción* **2015**, *11*, 25–30.

54. World Health Organization. *Global Recommendations on Physical Activity for Health*; WHO: Geneva, Switzerland, 2010.
55. Berger, B.G.; Darby, L.A.; Owe, D.R.; Carels, R.A. Implications of a Behavioral Weight Loss Program for Obese, Sedentary Women: A Focus on Mood Enhancement and Exercise Enjoyment. *Psychology Faculty Publications. IJSEP* **2010**, *8*, 10–23.
56. Moscoso, D.; Muñoz, V. Deporte, inclusión y diversidad social, antecedentes. *Rev. Andal. Cienc. Soc.* **2012**, *11*, 13–19.
57. Webster, C.A.; Webster, L.; Russ, L.; Molina, S.; Lee, H.S.; Cribbs, J. A Systematic Review of Public Health-Aligned Recommendations for Preparing Physical Education Teacher Candidates. *Res. Q. Exerc. Sport* **2014**, *86*, 30–39. [[CrossRef](#)] [[PubMed](#)]
58. D'Amico, E.J.; Rodriguez, A.; Tucker, J.S.; Dunbar, M.S.; Pedersen, E.R.; Shih, R.A.; Davis, J.P.; Seelam, R. Early and Late Adolescent Factors that Predict Co-use of Cannabis with Alcohol and Tobacco in Young Adulthood. *Prev. Sci.* **2000**, *21*, 530–544.
59. García-Canto, E.; Rosa-Guillamón, A.; Nieto-López, L. Nivel de actividad física, consumo habitual de tabaco y alcohol, y su relación con la calidad de vida en adolescentes españoles. *Retos* **2020**, *39*, 112–119. [[CrossRef](#)]
60. Chen, F. Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Struct. Equ. Model. A Multidiscip. J.* **2007**, *14*, 464–504. [[CrossRef](#)]
61. Cheung, G.W.; Rensvold, R.B. Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Struct. Equ. Model. A Multidiscip. J.* **2002**, *9*, 233–255. [[CrossRef](#)]
62. Carmen-Páez, J.; Hurtado, J. Formación inicial docente en profesores de educación física. Levantamiento de competencias específicas a partir de las necesidades del medio educativo. *Retos* **2019**, *35*, 61–66.
63. Fitzgerald, H.; Jobling, A.; Kirk, D. Valuing the voices of young disabled people: Exploring experiences on physical education and sport. *Eur. J. Phys. Educ.* **2003**, *8*, 175–201. [[CrossRef](#)]

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).