

Physical Education Curricular Elements in Blended Learning During the COVID-19 Pandemic

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Purpose: To describe the curricular elements in blended physical education (PE) during the COVID-19 pandemic. **Method:** A survey of PE teachers was conducted regarding curricular elements related to content blocks, instruction, and assessment. A total of 174 Spanish secondary PE teachers (120 men and 54 women) participated in the survey. **Results:** For the nonface-to-face part, instruction relied mainly on challenge-based learning as an instructional strategy, the learning of the designed individual program as a teaching–learning style, health-based PE as a pedagogical model, and self-assessment as the most used assessment form. **Discussion/Conclusion:** The study describes an overview of the characteristics of the curricular elements used in the blended learning PE model in secondary education. Both the age of PE teachers and the socioeconomic level of the families are variables to consider.

Keywords: secondary education, curriculum, assessment, instruction, educational technology

During the COVID-19 pandemic period, physical education (PE) teachers have had to manage the teaching and learning process to make the experimental, practical, and face-to-face nature of the PE subject compatible with the limitations promulgated by virtual approaches (O'Brien et al., 2020; Varea et al., 2022). After virtual learning in the last part of the 2019–2020 academic year, the Spanish Ministry of Education and Vocational Training announced the intention to ensure a maximum presence for students in secondary education schools for the 2020–2021 academic year, trying to avoid the negative effects of the digital divide (Order EFP/561/2020, 2020).

In addition to the traditional face-to-face learning model in Spanish secondary education, due to the COVID-19 pandemic, other learning models were allowed by the educational administration during the 2020/2021 academic year, such as blended learning. Thus, Order EFP/561/2020 (2020) established that secondary schools could opt for the learning model that best guarantees the educational process and the prevention of COVID-19 infections, depending on the context and the characteristics of their particular situation. Among these models, blended learning is defined as the reflective integration of “online” experiences into face-to-face classes (Garrison & Kanuka, 2004). The blended learning model in secondary education in Spain allowed students to attend the school for half of the school hours, and the other half was taught online through virtual educational platforms. Although the implementation of the model during the 2021–2022 academic year in secondary education was due to the COVID-19 pandemic, blended learning takes advantage of a variety of learning experiences that can be offered anytime (Blain et al., 2022). The

integration of blended learning has challenged traditional learning methods (Ballouk et al., 2022). Similarly, Goad et al. (2019) indicated that changes in learning models have also affected the use of technologies to enhance learning in virtual environments. Thus, for example, in recent years, numerous studies have appeared in relation to the application of instructional strategies in PE, such as gamification (Fernández-Río et al., 2020) and flipped learning (Cheng et al., 2019). It is of interest to discover more about the application of blended learning during the COVID-19 pandemic.

The characteristics of blended learning in secondary school PE, with half of the academic period being virtual and the need to use new technologies for communication and information, make it important to consider the possible impacts of PE teachers' age and teaching experience on the research (Hildebrandt & Eom, 2011). Likewise, the students' socioeconomic level has been one of the most determining variables in the virtual learning model in terms of what is known as the digital divide (Lythreathis et al., 2022).


Therefore, for the blended learning method of PE, 1 hr per week was devoted to face-to-face instruction, and 1 hr was devoted to asynchronous online learning. This has led to adaptations of curricular programs together with the development of new teaching approaches based on virtual environments (Howley, 2022). The skills needed to teach in online and blended environments are distinct from traditional teaching skills (Varea et al., 2022), and research studies that guide teachers on how to address the essential components of PE in the online environment are advisable (Centeio et al., 2021). This has led to an analysis and adaptation of the curricular elements and the teaching–learning process (O'Brien et al., 2020). Addressing the social needs of students and connecting with them might be hard to conceptualize in the virtual environment when PE teachers have traditionally relied on face-to-face interactions to accomplish these goals (Daum et al., 2021).

Due to the change in the learning model, PE teachers have had to reflect in a more specific way on the curricular elements (Varea et al., 2022) related to the content blocks, instruction (instructional

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strategies, teaching–learning styles, and pedagogical models), and assessment (techniques and instruments). In blended PE learning, several gaming techniques, such as scoring systems, levels, challenges, and narrative scenarios or badges, can be integrated into traditional units to help drive motivation and engagement and conciliate students' demands for gaming (Wahl-Alexander & McMurray, 2021).

The implementation of blended learning means a reformulation of didactic programming and an adaptation of the teaching–learning process. Online lessons are an exciting, even an attractive, option as an alternative method of delivering PE content at the secondary level (Daum & Buschner, 2018). The Royal Decree-Law 1105/2014 (2015, p. 172) establishes definitions for content, instruction, and the assessment of the student's learning. Content is defined as “the set of knowledge, abilities, skills, and attitudes that contribute to the achievement of the objectives of each teaching and educational stage and the acquisition of competence.” Instruction is defined as “the set of strategies, procedures and actions organized and planned by teachers, in a conscious and reflective manner, in order to enable students to learn and achieve the objectives set.” The assessment of the student's learning is defined as the process that seeks to determine the extent to which students are achieving learning outcomes.

To achieve quality PE learning in a blended model, the learning process should be adapted to include student–teacher contact, cooperation between students, learning scenarios, feedback, time on task, expectations, and attention to diversity (Beard & Konukman, 2020). Specifically, it is important to be aware of the adjustments required and whether they correspond to the selection and prioritization of content blocks, instruction, and assessment processes used by PE teachers. Unfortunately, the new circumstances necessitated due to COVID-19 have generated many doubts and even insecurity in PE teachers (Varea et al., 2022). PE teachers are now in the process of discovering how online networks may shape, enable, and constrain various aspects of education (Lander et al., 2020).

Research has been conducted on experiences in the fully online teaching–learning process of PE teachers during the lockdown period due to the COVID-19 pandemic (Centeio et al., 2021; Mercier et al., 2021). However, some systematic reviews show that research on blended learning in secondary education is very scarce (Daum & Buschner, 2018; Killian et al., 2019). At the same time, during the pandemic, blended learning has become obligatory for teachers and students (Daum et al., 2021; Order EFP/561/2020, 2020). To the best of our knowledge, no research has been reported on the curricular elements in the blended learning model in PE in secondary education in Spain. Therefore, it is advisable to understand the experience of PE teachers during the COVID-19 pandemic to facilitate the implementation of blended learning in the future. The more that is known about how PE blended learning is approached, the better it will guide initial and continuous PE teacher education.

Blended learning has reached unprecedented levels during the COVID-19 pandemic (Mercier et al., 2021; Varea et al., 2022). However, gaining insights into blended learning and deepening the understanding of how PE teachers deal with the blended learning experience will improve performance in the future under normal conditions, not just during the pandemic crisis. Blended learning provides new opportunities to improve PE that align with the mechanisms underpinning the theory of expanded, extended, and enhanced opportunities (Beets et al., 2016). Applied to PE, this theory includes the expansion of new opportunities to practice

PE outside the school, the extension of existing PE opportunities by increasing the amount of time allocated, and the enhancement of existing opportunities. A growing body of research suggests the need to transform the teaching of PE by underlining a greater personalization and use of digital technology, which is an essential aspect of blended models. Thus, it is necessary to gather evidence that allows PE teachers to efficiently implement curricular elements using blended learning in PE lessons. As Johnson et al. (2021) highlighted, more studies are needed to understand how to support PE teachers during crisis learning situations. Therefore, it is considered essential to continue researching and reflecting on the evolution of the teaching of PE in the situation of COVID-19 due to the insecurity expressed by teachers (Hortigüela-Alcalá et al., 2021).

The curricular elements related to the content blocks, instruction, and assessment are relevant to the quality of education (Mitchell & Walton-Fisette, 2022). Likewise, they are significant for the implementation of the new Spanish curriculum, Organic Law 3/2020, Article 6 (Organic Law 3/2020, 2020). The impact of the adoption of blended learning imposed by the COVID-19 pandemic on PE curricular elements in Spanish secondary education is unknown.

Thus, the aim of this research was to describe PE teachers' perceptions of how curricular elements (i.e., content, instruction, and assessment) were addressed in blended learning in PE lessons during the COVID-19 pandemic in the context of Spanish secondary education.

Method

Participants

Akin to previous research on PE during the COVID-19 pandemic (Mercier et al., 2021), a purposive sampling method was adopted to recruit and select participants. After removing invalid data, the response rate was 95%, and the final participating sample included 174 secondary school PE teachers (120 men and 54 women) aged between 26 and 59 years ($M = 44.05$, $SD = 5.88$), from Spain, with teaching experience ranging from 3 to 34 years ($M = 18.67$, $SD = 7.76$). A total of 151 teachers worked in public schools, and 23 worked in private schools. Furthermore, six teachers self-reported that the socioeconomic level of the students' families was low, 64 teachers indicated a low–middle socioeconomic level, 95 teachers self-reported a middle socioeconomic level, and nine teachers self-reported a high socioeconomic level.

Measures

To determine the characteristics of the content blocks, instruction, and assessment system of blended learning in PE during the COVID-19 pandemic, a survey was developed for this purpose following International Test Commission guidelines (Muñiz & Fonseca-Pedrero, 2019). First, the researchers gathered information to clarify curricular content and assessment based on the Royal Decree-Law 1105/2014 (2015) and conducted a conceptual delimitation for instruction regarding instructional strategies, teaching–learning styles, and pedagogical models by taking a series of reference publications (Cheng et al., 2019; Delgado-Noguera, 1991; Fernández-Río et al., 2018; Metzler, 2017).

Furthermore, the researchers analyzed 10 didactic programs of secondary education PE from the 2018/2019 academic year from different secondary schools in Spain to select the curricular

elements and their organization before the COVID-19 pandemic. For curricular content, the five content blocks were extracted: (a) health and life quality, (b) physical and motor fitness, (c) games and sports, (d) body expression, and (e) physical activity in the natural environment. Concerning instruction, the researchers identified an array of instructional strategies: flipped learning (Cheng et al., 2019), gamification (Kapp, 2012), or challenge-based learning (Johnson et al., 2009). Delgado-Noguera's (1991) *spectrum* of teaching–learning styles (widely known among Spanish PE teachers) was used to differentiate between traditional teaching–learning styles, individualizing teaching–learning styles, participating teaching–learning styles, socializing teaching–learning styles, cognitive teaching–learning styles, and creative teaching–learning styles. The research team also identified a set of pedagogical models (Fernández-Río et al., 2018; Metzler, 2017) frequently implemented by PE teachers: cooperative learning, sports education, teaching games for understanding, self-made materials, a ludotechnical model, health-based PE, social and personal responsibility, and an outdoor adventure model. Based on the information encountered by the research team, a first panel of three experts, including a part-time lecturer/secondary PE teacher and two university professors, provided responses to the survey through group discussion (Muñiz & Fonseca-Pedrero, 2019).

A second panel consisting of four new experts, including two part-time lecturers/secondary PE teachers and two university professors, independently assessed the content of every survey item by examining its representativeness, understanding, and clarity through a 5-point Likert-type scale (Muñiz & Fonseca-Pedrero, 2019). Based on the information from the Likert-type scales, Aiken's *V* index and interrater agreement were computed to analyze content validity and interrater reliability, respectively. Although there were scores higher than 0.80, which are considered suitable results (McGartland et al., 2003), in terms of representativeness, understanding, and clarity for the totality of survey items, the experts suggested specifying and clarifying the question on pedagogical models as they deemed it was too long. The main researcher considered these recommendations, inferring that it was necessary to redraft the item.

The new version of the survey was independently analyzed by a third panel of four experts (i.e., two part-time lecturers/secondary PE teachers and two university professors). After completing the same assessment procedure described in the previous step, satisfactory Aiken's *V* and interrater agreement values were found, and no proposals were received. Finally, a pilot study was developed with two PE teachers, who checked the correct understanding and clarity of every survey item and response. No suggestions were received.

For the survey development process, every participating expert had to meet the following criteria proposed by McGartland et al. (2003) and Lynn (1986): (a) relevant training on survey development, (b) large expertise as a content expert, (c) teaching experience in PE teacher education, and (d) publications in refereed journals on this topic. Following Lynn's (1986) recommendation of at least two experts per panel, every panel of experts included between three and four experts.

Procedure

Research information was distributed via secondary schools' official emails, professional colleges of PE graduates in Spain, and posts in several PE-related groups on three social networks (i.e., Facebook, WhatsApp, and Twitter) at the beginning of the

second term of the 2020/2021 school year (January to February). Therefore, the period of application of the survey coincided with when the PE teachers had taught during a school term in the 2020–2021 school year under the blended learning model, coming from complete online teaching during the last term (2019–2020 school year). The potential participants had to meet the following inclusion criteria: (a) older than 18 years of age, (b) secondary PE teacher, and (c) having taught PE throughout the COVID-19 pandemic. A total of 175 PE teachers contacted the research team, and they were invited as participants via email. Except for one person, who was removed from this research, all PE teachers gave their informed consent for participation through email. Then, the researchers provided a link to the online survey to every participating teacher. The survey contained information and instructions that explained to respondents that their participation was fully voluntary and anonymous. The guidelines also reported that there were no right or wrong responses and that the aim of the research was to discover PE teachers' perceptions of blended learning in secondary education during the COVID-19 pandemic. Data were confidential and used exclusively for academic and research goals in accordance with the ethical standards for research on human beings proposed in the Helsinki Declaration and approved by the ethics committee of the Andalusian Health Service (CEI-15-04-2019). The average time for completion was approximately 10 min.

Data Analysis

Data were analyzed using IBM SPSS (version 27.00). Whereas absolute and relative frequencies were estimated for categorical variables, mean scores, and *SD*, skewness and kurtosis coefficients were computed for continuous variables. Skewness and kurtosis coefficients are representative of a normal data distribution when standardized values are as high as 1.96 (Field, 2017). For categorical variables, differences in PE teachers' age and teaching experiences and students' educational and socioeconomic levels were analyzed by Pearson's χ^2 tests (Field, 2017). For continuous variables, significant differences in PE teachers' age and teaching experiences and students' educational and socioeconomic levels were examined using an analysis of variance. In those cases in which statistically significant differences were found, the Bonferroni correction was applied to determine between which groups this difference existed. Complementary to the level of statistical significance ($p \leq .05$), the effect size was calculated through Cramer's *V* index (*V*) for categorical variables and partial eta squared (η_p^2) for continuous variables. Effect sizes are considered small, medium, and large when Cramer's *V* is higher than 0.10, 0.30 and 0.50 and when partial eta squared is greater than .01, .06, and .15, respectively (Field, 2017).

Results

Content Blocks Used in PE Blended Learning

Combination of Content Blocks

The combination of the content blocks of health and life quality with physical and motor fitness was most frequently selected by PE teachers (77.59%). Table 1 shows that the selection of content blocks was not related to age, $\chi^2(18) = 16.94, p = .54$, the teaching experience of the PE teachers, $\chi^2(42) = 33.89, p = .81$, the educational level of the students, $\chi^2(12) = 13.06, p = .37$, or the socioeconomic level of the students' families, $\chi^2(18) = 7.25, p = .99$.

Table 1 Differences by Age, Experience Teaching, Educational Level, and Socioeconomic Level in Elements Concerning Content Blocks and Instruction

	Age			Experience teaching			Educational level			Socioeconomic level		
	$\chi^2(df)$	<i>p</i>	<i>V</i>	$\chi^2(df)$	<i>p</i>	<i>V</i>	$\chi^2(df)$	<i>p</i>	<i>V</i>	$\chi^2(df)$	<i>p</i>	<i>V</i>
Contents												
Content in blended learning	16.94 (18)	.55	0.18	33.05 (36)	.61	0.14	13.06 (12)	.37	0.19	7.25 (18)	.99	0.11
Combined content blocks	19.39 (24)	.73	0.19	54.01 (48)	.26	0.22	13.65 (16)	.63	0.20	29.54 (24)	.20	0.23
Most used criteria	7.66 (6)	.26	0.14	13.17 (12)	.31	0.09	7.07 (4)	.13	0.14	5.67 (6)	.46	0.12
Instruction												
Instructional strategies	9.42 (9)	.40	0.13	743.67 (18)	<.01	0.29	0.85 (6)	.99	0.05	12.16 (9)	.21	0.15
Teaching–learning styles	3.17 (6)	.78	0.09	13.04 (12)	.37	0.09	3.37 (4)	.50	0.10	3.08 (6)	.80	0.09
Pedagogical models	5.88 (6)	.44	0.13	25.43 (12)	.01	0.27	1.76 (4)	.78	0.07	5.75 (6)	.45	0.13

Note. *df* = degree of freedom; *V* = Cramer's *V* effect size measure.

Frequency of Combinations of Two Content Blocks

When deciding which content to work on in the face-to-face part of the class, 94 (50.02%) PE teachers chose a single criterion, and 80 (49.98%) PE teachers selected two criteria. The criterion most frequently used by PE teachers when deciding on the content was Criterion 3, “priority to the most practical and procedural content” (21.26%). This criterion was followed with the same frequency by Criterion 2, “ease of coordinating with the nonface-to-face part” (14.37%), and the combination of Criteria 1 and 2 (14.37%). Table 1 displays nonsignificant differences for age, $\chi^2(24) = 19.39$, $p = .73$, and teaching experience, $\chi^2(56) = 60.52$, $p = .32$, of the PE teachers as well as for the educational level of the students, $\chi^2(16) = 13.65$, $p = .63$, and the socioeconomic level of the students' families, $\chi^2(24) = 29.54$, $p = .20$.

Frequency of Criteria Most Used by PE Teachers

A total of 100 (57.47%) PE teachers indicated that they had used the same content blocks in both face-to-face and nonface-to-face classes, whereas 71 (40.81%) of them reported that they had worked on different content for both classes. Table 1 shows nonsignificant differences regarding the contents during the development of face-to-face and nonface-to-face classes in terms of age, $\chi^2(7) = 7.66$, $p = .62$, teaching experience of PE teachers, $\chi^2(14) = 14.50$, $p = .42$, the educational level of the students, $\chi^2(7) = 7.07$, $p = .13$, and the socioeconomic level of the students' families, $\chi^2(6) = 5.67$, $p = .46$.

Instruction Used in PE Blended Learning

Instructional Strategy

A total of 97 (55.75%) PE teachers declared that they used a single teaching instructional strategy, highlighting the use of challenge-based learning (75 PE teachers) and project-based learning (12 PE teachers). Table 1 shows that the use of instructional strategies was significantly influenced by teaching experience, $\chi^2(21) = 743.67$, $p < .01$, $V = .29$. In particular, Pearson's χ^2 post hoc tests found that PE teachers with less than 5 years of teaching experience more frequently used a single teaching instructional strategy. PE teachers with teaching experience between 15 and 19 years and between 20 and 24 years tended to implement two instructional strategies in practice. Similarly, PE teachers with more than 30 years of teaching experience used three teaching instructional strategies more frequently.

Teaching–Learning Styles

A total of 42 (24.14%) PE teachers indicated that only one kind of teaching–learning style was adapted to blended learning (Table 2). In contrast, 131 (75.29%) PE teachers affirmed the combination of two groups of teaching–learning styles for blended learning, including individualizing and creative teaching–learning styles (34 PE teachers). Table 1 shows that the use of teaching–learning styles was not significantly influenced by the age, $\chi^2(6) = 3.17$, $p = .79$, or teaching experience, $\chi^2(14) = 13.60$, $p = .48$, of the PE teachers. No statistically significant differences were found in the use of teaching–learning styles depending on the educational level of the students, $\chi^2(4) = 3.37$, $p = .50$, or the socioeconomic level of the students' families, $\chi^2(6) = 3.08$, $p = .78$.

Pedagogical Model

A total of 65 (37.36%) PE teachers declared not having used any pedagogical model for blended learning. On the other hand, Table 2 shows that 32 PE teachers indicated that they had used a pedagogical model, highlighting health-based PE (22 PE teachers). In addition, 68 PE teachers referred to two pedagogical models used. Table 2 shows that the use of pedagogical models significantly depended on teaching experience, $\chi^2(12) = 25.43$, $p = .01$, $V = 0.27$. Specifically, Pearson's χ^2 post hoc tests revealed that whereas PE teachers with less than 5 years of teaching experience and PE teachers with more than 30 years of teaching experience tended to use two pedagogical models more frequently, PE teachers with between 10 and 19 years of teaching experience did not frequently use two pedagogical models for blended learning.

Assessment Used in PE Blended Learning

Assessment Forms

Table 3 shows mean scores higher than the midpoint of the measurement scale for self-assessment and coassessment, whereas family collaboration in assessment obtained a mean score below the midpoint of the measurement scale.

Table 3 shows significant differences in family collaboration in assessment across age, $F = 4.37$, $p < .01$, and teaching experience, $F = 2.73$, $p = .02$, $\eta_p^2 = .09$, as well as in coassessment across educational level. More particularly, the Bonferroni adjustment revealed that PE teachers aged between 30 and 39 years old used family collaboration in assessment at a more significant level than those aged between 40 and 49 years old ($M_{dif} = 0.68$, $p < .01$).

Table 2 Teaching–Learning Styles and Pedagogical Model

	Absolute frequency	Relative frequency (%)
Teaching–learning styles		
Individualizing	13	8.02
Traditional	11	6.79
Creative	11	6.79
Participatory	6	3.70
Cognitive	1	0.62
Individualizing + creative	34	20.99
Individualizing + traditional	16	9.88
Individualizing + cognitive	11	6.79
Others	59	36.42
Pedagogical models		
Health-based PE	22	12.64
Social and personal responsibility	5	2.87
Self-made of materials	5	2.87
Self-made of materials + health-based PE	12	6.90
Teaching games for understanding + health-based PE	12	6.90
Social and personal responsibility + health-based PE	11	6.32
Others	107	61.50

Note. PE = physical education.

In addition, PE teachers with fewer than 5 years of teaching experience had a greater perception of family collaboration in the assessment than those with teaching experience between 15 and 19 years ($M_{dif} = 0.76, p = .01$) and between 20 and 24 years ($M_{dif} = 0.72, p < .01$). Furthermore, postcompulsory secondary PE teachers used the coassessment more than the compulsory secondary education PE teachers ($M_{dif} = 0.61, p < .01$). Finally, students with a low socioeconomic level obtained lower scores in self-assessment than those with a medium–low ($M_{dif} = 1.29, p < .01$) and medium socioeconomic level ($M_{dif} = 1.03, p < .01$).

Assessment Instruments

Table 3 displays the use of assessment instruments. Family confirmation of tasks completion and oral exams by videoconference scored lower than the midpoint of the scale, rubric, portfolios of evidence of performance, questionnaire in virtual platform, registration in sports applications, and written works obtained higher mean values than the scale.

Table 3 displays significant differences in the use of rubrics by educational level and socioeconomic level as well as significant differences by socioeconomic level in questionnaires on a virtual platform, registration in sports applications, and family confirmation of completion. Concerning differences by educational level, the Bonferroni adjustment found that the PE teachers who taught classes in postcompulsory and compulsory secondary education obtained significantly higher average scores than the PE teachers who taught classes in compulsory secondary education in the use of the rubric ($M_{dif} = 0.59, p < .01$). Regarding the socioeconomic level of the students' families, the Bonferroni adjustment revealed that PE teachers used the rubric less frequently with students of a low socioeconomic level compared with students of both a medium–low socioeconomic level ($M_{dif} = 1.15, p = .01$) and a medium socioeconomic level ($M_{dif} = 0.98, p = .01$). Similarly, the PE

teachers used the rubric more frequently with students of both a medium–low socioeconomic level ($M_{dif} = 1.54, p < .01$) and a medium socioeconomic level ($M_{dif} = 1.37, p < .01$) in comparison with students of a high socioeconomic level.

Second, concerning the use of questionnaires, PE teachers used them as an instrument more frequently with students of both a medium–low socioeconomic level ($M_{dif} = 1.33, p < .01$) and a medium socioeconomic level ($M_{dif} = 1.14, p < .01$) compared with students of a high socioeconomic level. Third, regarding the use of records in sports applications, the Bonferroni adjustment showed that students with a medium socioeconomic level used the sports application records more than students with a high socioeconomic level ($M_{dif} = 1.02, p < .01$). Regarding the use of family confirmation of achievement, the Bonferroni adjustment showed that this instrument was more frequently used with students of a low socioeconomic level ($M_{dif} = 1.11, p < .01$), a medium–low socioeconomic level ($M_{dif} = 0.84, p = .009$), and a medium socioeconomic level ($M_{dif} = 0.98, p < .01$) than with students from a high socioeconomic level.

Discussion

The purpose of this study was to explore the curricular content blocks, instruction, and assessment performed by PE teachers in secondary education during the COVID-19 pandemic. The main results underscored that the PE teachers considered health and motor fitness to be the curricular content that best suited the blended learning method and opted for the most practical activities in the face-to-face components of learning. Likewise, challenge-based learning as an instructional strategy, the individualizing and creative teaching–learning styles, the health-based pedagogical model, and self-assessment all played a prominent role during the period of blended learning.

Table 3 Descriptive Statistics and Differences by Age, Experience Teaching, Educational Level, and Socioeconomic Level in Assessment

	Total sample			Age			Experience teaching			Educational level			Socioeconomic level		
	<i>M</i> (<i>SD</i>)	γ_1	γ_2	<i>F</i> (<i>df</i>)	<i>p</i>	η_p^2	<i>F</i> (<i>df</i>)	<i>p</i>	η_p^2	<i>F</i> (<i>df</i>)	<i>p</i>	η_p^2	<i>F</i> (<i>df</i>)	<i>p</i>	η_p^2
Forms															
Self-assessment	3.22 (1.11)	-0.25	-0.97	0.64 (3)	.59	.01	1.55 (6)	.50	.03	0.76 (2)	.47	.01	2.82 (3)	.04	.05
Coassessment	2.91 (1.18)	-0.05	-0.98	1.63 (3)	.18	.03	1.21 (6)	.31	.04	3.96 (2)	.02	.04	1.18 (3)	.32	.02
Family collaboration in the assessment	2.22 (1.14)	0.70	-0.39	4.37 (3)	<.01	.07	2.73 (6)	.02	.10	0.29 (2)	.75	.01	0.89 (3)	.45	.02
Instruments															
Rubric	3.77 (1.14)	-0.86	-0.19	1.31 (3)	.27	.02	1.52 (6)	.17	.05	4.25 (2)	.02	.05	5.60 (3)	<.01	.09
Portfolios of evidence of performance	3.89 (1.22)	-0.54	-0.49	3.62 (3)	.06	.04	2.05 (6)	.06	.07	0.06 (2)	.94	.01	2.32 (3)	.08	.04
Questionnaire on virtual platform	3.79 (1.19)	-0.97	0.20	0.49 (3)	.69	.01	1.11 (6)	.36	.04	1.48 (2)	.23	.02	4.49 (3)	<.01	.07
Registration in sports applications	3.52 (1.15)	-0.25	-0.71	2.18 (3)	.09	.04	1.89 (6)	.09	.06	0.78 (2)	.46	.01	3.16 (3)	.03	.05
Written works	3.45 (1.20)	-0.28	-0.85	0.19 (3)	.91	.01	0.54 (6)	.78	.02	0.88 (2)	.42	.01	0.95 (3)	.42	.02
Family confirmation of completion	2.10 (1.03)	1.10	1.03	1.54 (3)	.21	.03	1.04 (6)	.40	.04	0.37 (2)	.70	.01	2.67 (3)	.04	.05
Oral exams by videoconference	2.06 (1.04)	1.11	0.76	1.42 (3)	.24	.02	1.93 (6)	.08	.07	1.21 (2)	.30	.02	0.49 (3)	.69	.01

Note. γ_1 = standardized coefficient of skewness; γ_2 = standardized coefficient of kurtosis; *df* = degree of freedom; η_p^2 = partial eta squared.

As indicated, the combination of health and life quality content blocks with physical and motor fitness was the most used by the PE teachers surveyed in the current study. These results are consistent with those found in a study carried out during the COVID-19 lockdown wherein the same teaching content related to physical fitness and health was the most used by PE teachers (Baena-Morales et al., 2020). Likewise, the relevance of health and fitness activities in online PE classes has been previously highlighted (Killian et al., 2021). In addition, PE teachers admitted to being very limited in terms of content to be taught during COVID-19 (Hortigüela-Alcalá et al., 2021). The content blocks related to health and fitness appear to have been better suited to blended learning during the pandemic than others, such as sports. There are several reasons that may explain the prevalence of these content blocks in PE during the COVID-19 pandemic. On the one hand, health and fitness activities were better adapted to the home context from which the student followed the online classes during the pandemic (Killian et al., 2021) and allowed easy adaptation to the individual (Varea & González-Calvo, 2021). On the other hand, in the face-to-face time of blended learning, these activities facilitated compliance with the security measures imposed by the health authorities, such as safe distancing, the independent use of material, and the need to avoid physical contact (Varea et al., 2022).

In the same way, the criterion most frequently used by PE teachers when deciding the content to teach in the face-to-face component has been prioritizing the most practical and procedural content, which is consistent with a clear intention to promote students' physical activity to benefit their health (Jeong & So, 2020). The results agree with Daum and Buschner (2018) and Johnson et al. (2021), who found that the benefit of the blended learning model is that face-to-face time addresses minimal student socialization and motor skill learning. Hence, giving priority to practical and procedural content during face-to-face time appears to reflect PE teachers' commitment to maximizing social relationships and motor learning to compensate for the inconveniences of online learning.

The use of challenge-based learning as an instructional strategy to promote leisure-time physical activity has played a leading role. Similar results were found in a previous study performed before the COVID-19 pandemic in secondary education (Gil-Espinosa et al., 2020) and in another study carried out during the lockdown of the 2019–2020 academic year in a primary rural school (Sierra-Díaz et al., 2021). Despite the benefits of the flipped learning instructional strategy reported in prior research (Cheng et al., 2019), this strategy was not found to be one of the instructional strategies most used by PE teachers in the current study. The flipped learning instructional strategy may have been used in conjunction with challenge-based learning or project-based learning in blended learning, which would explain why a higher usage has not been detected. However, this research did not analyze this fact.

The PE teachers' preference for challenge-based learning can be related to the desire to get students to value and have fun doing physical activity, which was one of the main PE aims highlighted by teachers during nonface-to-face teaching (Mercier et al., 2021). The use of gamified elements, such as challenges, has been used as an online teaching strategy during COVID-19 in several areas other than PE to enhance students' motivation and to mitigate the physical and psychological constraints associated with quarantine (Nieto-Escamez & Roldán-Tapia, 2021). Likewise, Blain et al. (2022) showed the potential for PE to rebuild after the COVID-19 pandemic by implementing blended gamified approaches.

Therefore, gamification can be a valuable instrument during post-COVID times.

The use of instructional strategies was significantly influenced by the number of years of teaching. It is noteworthy that the greater the teaching experience, the greater the variety of instructional strategies used by the PE teachers surveyed in the current study. Prior research provides empirical evidence of age boundaries that may affect teacher motivations and, in turn, teaching behaviors (Hildebrandt & Eom, 2011), which may partially explain these differences. Likewise, the results could have a relationship with the characteristics of the stage of the teaching career (Hildebrandt & Eom, 2011). Although previous research has found that as teaching experience increases, the levels of participation in professional learning activities decrease (Zhang et al., 2021), the current study suggests that the accumulated training along the professional career could help teachers with a longer teaching experience have a wider range of instructional strategies.

Approximately 75% of the PE teachers recorded the use of a concurrent teaching–learning style, that is, using two different teaching–learning styles at the same time during blended learning. One of them was always the individualizing teaching–learning style. These results are in line with previous studies wherein individualizing styles were the most used during the lockdown period (Varea & González-Calvo, 2021), providing levels where students can progress at their own pace (Wahl-Alexander & McMurray, 2021) and try to adapt to the conditions and availability of space and materials for each student (López-Fernández et al., 2021).

The health-based PE model, defined as “pupils valuing a physically active life, so that they learn to value and practice appropriate physical activities that enhance health and wellbeing for the rest of their lives” (Haerens et al., 2011), was the most used by teachers. These results could point to concern among teachers in alleviating the impact of the COVID-19 pandemic on students' health because, as Reuter et al. (2021) reported, there was a worsening of habits and behaviors related to physical activity during this period. The COVID-19 pandemic has emphasized the importance of physical health as a core educational aim (Blain et al., 2022). On the other hand, most of the PE teachers with teaching experience between 10 and 19 years did not report the use of any pedagogical model for blended learning. This circumstance could be justified in the preservice training received by PE teachers with less experience and the continuous training of PE teachers with more than 30 years of experience, which has allowed them to know and apply pedagogical models, which are concepts of recent incorporation in PE teaching in Spain. Hence, the teaching stages (Hildebrandt & Eom, 2011) and the teachers' training (Zhang et al., 2021) might explain this difference in the use of pedagogical models.

Regarding the forms of assessment, self-assessment was the most recommended by PE teachers for the nonface-to-face part. These data are in agreement with several studies that have found that students' participation in the assessment process, supported with digital technology resources, could enhance the learning process during blended learning experiences (Daum et al., 2021). It seems that self-assessment has helped PE teachers deal with the limitations of traditional procedures to assess the virtual part of blended learning (Jeong & So, 2020). As shown during lockdown (Baena-Morales et al., 2020), assessment has been one of the greatest difficulties encountered by PE teachers, possibly motivated by the change of model and the lack of clear instructions from authorities (Coulter et al., 2021). These contingencies may

explain the PE teachers' recommendation to opt for new forms of evaluation in which the student plays a more active role. Another form of recommendation suggested by the PE teachers was co-assessment, coinciding with the recommendation of the Royal Decree-Law 1105/2014 (2015). Likewise, the difference found in terms of use of the coassessment form between the postcompulsory secondary education PE teachers, who more frequently used it with the students, compared with the compulsory PE teachers could suggest a differentiated use of assessment forms depending on the maturity of the students. Further research is needed to confirm this relationship. The collaboration of families in the assessment was the least recommended form of assessment in this study. These data do not agree with the research performed by Sierra-Díaz et al. (2021), which pointed out that during the COVID-19 lockdown, families sent activity evidence, such as videos or photographs, as assessment means. The context in which this latter study was carried out (primary education and a rural area) could explain the differences with the current study.

Assessment was specifically conditioned by the socioeconomic level of the students' families. Thus, instruments that require basic digital support (i.e., lower Wi-Fi quality or ones that can be carried out from a telephone), such as the questionnaire and family confirmation, were more frequently used in students with low or medium–low socioeconomic status. Coulter et al. (2021), regarding virtual teaching during COVID-19, stated that the resources for the assessment should include elements aligned with the learning objectives, which favor individualized and immediate feedback. Therefore, the disparity in the availability of technological resources and the knowledge of their use by families could justify the use of different assessment instruments to avoid the digital divide and adapt teaching to make it personalized (García-Vandewalle García et al., 2022). Therefore, the implementation of a blended learning model has brought to light realities linked to equitable access to education (Howley, 2022). In fact, Cheung et al. (2015) recommended further measures to reduce the digital divide and provide support to students from families with lower socioeconomic levels. Several studies have reported a digital divide or social gap that the COVID-19 crisis has exacerbated (Fernández-Río et al., 2022). Moreover, the family socioeconomic level and the availability use of new technologies affect the school performance of the students (Daum et al., 2021), which could justify why PE teachers have considered it useful to apply different content blocks, instructional strategies, or assessment systems depending on the context of application of the blended learning model to reduce the negative effects of the digital divide. In fact, there are limitations related to students' and PE teachers' access to technology that impact the learning environment (Daum et al., 2021).

Limitations, Strengths, and Future Research Proposals

Although this research sheds light on PE teachers' perceptions of how curricular elements (curricular content blocks, instruction, and assessment) were implemented using blended learning throughout the COVID-19 pandemic in Spain, there are several limitations that should be mentioned. This research used a cross-sectional design and a purposive sampling method. Notwithstanding, this study highlights the lack of knowledge about the use of different curricular elements prior to the implementation of the blended learning model. The current research might establish a starting point from which to develop new research studies. However, the lack of previous studies makes it difficult to carry out an in-depth

discussion. A second limitation has been the absence of an internationally widespread terminology in the field of PE, which has largely hindered the conceptual delimitation of the different curricular elements, especially regarding instruction; for example, those known in Spain as emerging pedagogical models do not have the same recognized international terminology. A third limitation would be the small number of experts participating in the survey development process, although the rule of at least two experts for each phase was followed (Lynn, 1986). A fourth limitation was the exclusive use of a self-reported online survey as a data collection instrument. Other limitations are not accounting for potential individual and area-level confounding variables, not including area-level factors as a predictor in the analysis, the small sample size, and the potential to generalize these findings to other school settings, age groups, countries, etc.

One of the strengths of this study is the description of the curricular elements used in the blended learning PE model in secondary education. It has allowed for an overview of the characteristics of the teaching and learning process in the provision of knowledge to improve a comprehensive, theory-driven research agenda and makes recommendations regarding the use of virtual and blended learning in PE curricula development (Killian et al., 2019). Future research should deal with the continuity of the curricular content, instructional strategies, and assessment that PE teachers have used mostly in the blended learning model. Given shifts in COVID-19 incidence over time, future studies should analyze the evolution of the impact of the pandemic on teaching and learning across time. In addition, it would be useful to analyze how to address teaching in virtual, blended, and socially distanced environments in the training of PE teachers. Further research is, therefore, recommended to complement this type of instrument with observational tools and qualitative instruments (i.e., interviews and diaries) that enable the triangulation of data.

Conclusion

The study describes an overview of the characteristics of the curricular elements used in the blended learning model in secondary education PE. The main results indicate the importance of variables such as the age of PE teachers and the student's socioeconomic level in determining the use and implementation of curricular elements through blended learning in PE lessons. The results seem to indicate that teachers have developed blocks of PE content with the aim of achieving greater individualization of the teaching–learning process, the implementation of instructional strategies to integrate the face-to-face and virtual parts, and the use of forms and instruments of assessment in trying to adapt to the family and personal context of the students. Therefore, as a practical implication, there exists the need to adapt to the availability and training in the use of technological means for students, families, and teachers. This issue will be a determining factor in the choice of content blocks, instructional strategies, and assessments and plays a fundamental role in the virtual part of blended learning. The use of new technologies could help to improve coordination between the face-to-face and virtual parts of the different curricular elements in blended learning. Likewise, it could improve attention to student diversity in blended learning, provided that adequate levels of availability and knowledge are achieved.

The differences found in the use of instructional strategies based on the teaching experience suggest focusing efforts on an increase in specific training in instructional strategies both in the preservice teacher training and in the continuing education of

teachers. In the latter, the knowledge of the most experienced teachers could be used through peer learning.

Future research should deepen the characteristics of blended learning in PE to achieve quality implementation, especially in relation to the virtual part of teaching and aspects such as access to technological resources as well as the training of teachers and students in their usage. Likewise, new studies should consider the development of content blocks, other than health and fitness (e.g., sports or outdoor activities), in virtual settings. At the same time, more research is needed on the implementation of instructional strategies that help coordinate the face-to-face and virtual parts of the blended learning model. In this sense, the possibilities of promising instructional strategies, such as flipped learning, should be analyzed in future studies.

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