IMPROVING COMPETENCES IN PHYSICAL EDUCATION: INTERVENTION BASED ON STUDENTS' PRACTICE PREFERENCES AND AUTONOMY SUPPORT

MELHORA DAS COMPETÊNCIAS NA EDUCAÇÃO FÍSICA: INTERVENÇÃO BASEADA NAS PREFERÊNCIAS DE PRÁTICA DOS ESTUDANTES E NO APOIO À AUTONOMIA

MEJORA DE LAS COMPETENCIAS EN EDUCACIÓN FÍSICA: INTERVENCIÓN BASADA EN LAS PREFERENCIAS DE PRÁCTICA DE LOS ESTUDIANTES Y EN EL APOYO A LA AUTONOMÍA

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ABSTRACT: The aim of the study was to test whether an intervention based on students' practice preferences, using a motivating teaching style that supports autonomy, could improve key competencies in Physical Education. A total of 115 students from 11 to 14 years old participated in the study. A quasi-experimental design was used, during 36 weeks, in which one group followed a teaching intervention, aiming to support autonomy, while a control group did not have any differentiated methodological intervention. The students were evaluated before and after the intervention in relation to their preferences for physical education practices, competencies and perception of teacher interaction. The results indicate that considering preferences for practice and using autonomy support improves students' perception of autonomy and competence, which is reflected in an improvement in functional learning, its transference and its practical orientation.

KEYWORDS: Intervention. Competencies. Autonomy support. Motivation. Physical education.

RESUMO: *O objetivo do estudo foi testar se uma intervenção baseada nas preferências de prática dos alunos, utilizando um estilo de ensino motivador que apoie a autonomia, poderia melhorar as competências-chave em Educação Física. Participaram 115 alunos de 11 a 14 anos. Utilizou-se um delineamento quase-experimental, durante 36 semanas, em que um grupo seguiu uma intervenção docente, visando apoiar a autonomia, enquanto um grupo controle não teve nenhuma intervenção metodológica diferenciada. Os alunos foram avaliados antes e após a intervenção, em relação às preferências por práticas em educação física, competências e percepção quanto à interação docente. Os resultados indicam que considerar as preferências pela prática e utilizar o apoio à autonomia melhora a percepção de autonomia e competência dos alunos, o que se reflete em uma melhora na aprendizagem funcional, sua transferência e sua orientação prática.*

PALAVRAS-CHAVE: *Intervenção. Competências. Apoio à autonomia. Motivação. Educação física.*

RESUMEN: *El objetivo del estudio fue comprobar si una intervención basada en las preferencias de práctica de los estudiantes, utilizando un estilo de enseñanza motivador que apoye la autonomía, podría mejorar las competencias clave en educación física. Participaron 115 alumnos de 11 a 14 años. Se utilizó un diseño cuasiexperimental, durante 36 semanas, en el que un grupo siguió una intervención del docente, dirigida a apoyar la autonomía, mientras que un grupo de control no tuvo ninguna intervención metodológica diferenciada. Los estudiantes fueron evaluados antes y después de la intervención, con relación a las preferencias de prácticas en educación física, competencias y percepción respecto a la interacción docente. Los resultados indican que considerar las preferencias de práctica y utilizar el apoyo a la autonomía mejora la percepción de autonomía y competencia de los estudiantes, que se refleja en una mejora del aprendizaje funcional, de su transferencia y de su orientación práctica.*

PALABRAS CLAVE: *Intervención. Competencias. Apoyo a la autonomía. Motivación. Educación física.*

Introduction

Physical Education classes have proven to be an excellent way to encourage the practice of physical activity, especially when adapted to your needs and preferences, and are carried out under a positive social climate, improving autonomy, commitment and conceptual learning, and for this to happen, the adolescent must be motivated (Jang; Reeve; Halusic, 2016; Weeldenburg *et al.,* 2021).

Based on the Self-Determination Theory (SDT or TAD, in Portuguese) (Deci; Ryan, 2000, 2013), the study of interaction in the Physical Education classroom and its effects on student autonomy has been attracting interest in the literature (Bureau *et al.,* 2022; Cheon *et al.,* 2014; Fin *et al.,* 2019a; Perlman, 2015). SDT proposes to explain human behavior based on different motivational styles, context influences and interpersonal perceptions, with three basic psychological needs, which are related to motivation: autonomy, which is linked to the level of independence and control over choices made by a person; competence, which refers to a person's ability to perform a task; and relationships with others, which is linked to the perception of a sense of connection with other participants (Ryan; Deci, 2000, 2017). For this theory, motivation is established in a continuous process that can present more self-determined behaviors (intrinsic motivation) or less self-determined behaviors (extrinsic motivation), so that, when one experiences a greater perception of autonomy, competence and relationships with others, it generates a higher level of intrinsic motivation. On the other hand, if these needs are not met, greater extrinsic motivation or even unmotivated behaviors will be observed.

During Physical Education classes, it was observed that the didactic aspects implemented by teachers can have a significant impact on the degree of autonomy, competence and relationships with others experienced by students (Cheon; Reeve, 2015; Fin *et al.,* 2019a). Teachers can use different pedagogical approaches during Physical Education classes, using interpersonal styles that are on a continuum from a controlling style, in which external incentives are offered and pressure is placed on the student, to a style that encourages autonomy, which gives the student responsibilities, that contributes to increasing students' intrinsic motivation (Escriva-Boulley *et al.,* 2018; Reeve *et al.,* 2014).

A teaching style that supports autonomy and allows students to learn at their own pace, without using a language of control, favors the satisfaction of the basic psychological needs of competence, autonomy and relationships with others, making students improve their performance, perceive themselves as more competent and persistent in carrying out activities,

thus achieving more self-determined motivation (Abós *et al.,* 2017; Van Den Berghe *et al.,* 2016).

Thus, when learning occurs in an environment in which students can put their preferences and resources into play and can develop strategies to solve the problems they face, self-determined motivation is fostered (Haerens *et al.,* 2013; Ryan; Deci, 2000). Some studies have already revealed the effectiveness of teaching based on students' preferences in relation to autonomy (Garcia; López; Benavent, 2016; Jang; Reeve; Deci, 2010; Vera Lacárcel, 2010).

If the teacher's motivational style in a teaching-learning situation can generate a social climate that intrinsically motivates the student to participate in tasks on their own initiative (Ryan; Deci, 2000) and their involvement increases when their preferences are taken into account (Benita; Roth; Deci, 2014), positively affecting adherence to the practice (Escriva-Boulley *et al.,* 2018), approaching Physical Education classes from this motivational perspective can help to design authentic situations that promote applied knowledge and develop skills (Brown, 2015; Ministerio de Educación, Cultura y Deporte, 2015; Monereo, 2009).

Competency-based teaching involves promoting student performance so that they can use their acquired knowledge effectively in resolving complex situations (Perrenoud, 2004). Competence is understood as the ability to successfully face complex challenges in a specific context, using knowledge, cognitive and practical skills, as well as social and behavioral elements, including attitudes, emotions, values and motivations (OECD, 2005). Therefore, competency-based learning refers to an adaptive behavioral pattern, supported by a proactive motivational orientation and the product of a mobilization of resources transferred to the context (Méndez-Alonso; Méndez-Giménez; Fernández-Río, 2016; OECD, 2005), the development of skills in Physical Education will be more self-determined to the extent that the design of teaching-learning situations involves the student, allows them to choose and takes into account their preferences and interests (Benita; Roth; Deci, 2014; Moreno-Murcia; Llorca Cano; Huéscar Hernández, 2020)

Based on the arguments above, the main objective of the study was to test whether an intervention based on students' practice preferences and implemented through the motivational, autonomy-supportive teaching style could improve the development of competencies in Physical Education.

Method

Participants

The study was carried out with a sample of 115 first-year high school students from a public school. Participants' ages ranged from 11 to 14 years (M = 12, SD = .65), with 48% girls (n = 56) and 52% boys (n = 59). Participants were divided into an intervention group and a control group.

Measurement

Preferences for Physical Education Practice (PPEF). To record students' practice preferences during physical education classes, the PPEF scale was used (Barrachina-Peris; Moreno-Múrcia, 2022). The 14 items on the scale are preceded by the title "In physical education class, would you like...", which are scored according to a Likert -type scale from 1 (I don't like it at all) to 5 (I like it a lot) and are distributed in three dimensions, with eight items corresponding to materials, three items corresponding to spaces, and six items corresponding to new technologies. The internal consistency for the pre-test was .79 for the materials, .70 for the spaces and .83 for the ICT and for the post-test it was .77, .71 and .80.

Autonomy support. To record the perception of support for teacher autonomy, students responded to the short version, adapted for physical education, of the Learning Climate scale Questionnaire (LCQ) (Jang *et al.,* 2009), validated in the Spanish context (Núñez *et al.,* 2012). The 5 scale items preceded by "My physical education teacher..." are scored on a Likert scale, from 1 (totally disagree) to 7 (totally agree). The internal consistency in the pre-test and post-test was .87 and .88, respectively.

Teacher control. To measure the perception of controlling style, *Controlling Teacher Questionnaire* (CTQ) (Jang *et al.,* 2009) adapted to physical education was used. The scale is measured by a Likert -type scale from 1 (Strongly disagree) to 7 (Strongly agree), has four items and is preceded by the title: "My teacher...". The internal consistency of the pre-test was .73 and the post-test was .79.

Competencies (EEC). To assess competencies in physical education, the Competency Assessment Scale (EAC) (Barrachina-Peris, 2017) was used, which measures five scenarios in Physical Education composed of four indicators each: Competence Situation Warm-up, Competence Situation Game of Invasion, Expression of Competence Situation, Competence Situation Exposition of a Game and Competence Situation Comment on the subject's *blog*.

Items are scored on a Likert scale, from 1 (Not acquired) to 4 (Fully acquired). A score is assigned to each indicator and the average is calculated to determine the student's overall level of proficiency in the situation being assessed. The general assessment is made on a scale ranging from 1 (acquisition process not started or not acquired) to 4 (acquisition process completed and consolidated, or very good/excellent). The internal consistency of the pre-test was .75 and the post-test was .80.

Motivating Teaching Style. To measure teaching behavior through an observational measurement instrument, the Measuring Motivational Teaching Style (MEID) scale was used (Barrachina-Peris; Moreno-Murcia; Huéscar, 2022). The scale consists of 60 items, preceded by the statement "During instruction, the teacher..."; and measures four dimensions: autonomy support (with five items for autonomy support and five items for controlling style); pre-task structure support (with five items for autonomy support and five for controlling style); support for structure during the task (with eight items for autonomy support, eight for controlling style and four for neutral style); and relational support (with seven items for autonomy support, seven for controlling style and five for neutral style).

Procedure

The project was approved by the Project Assessment Body of the main researcher's university (2017.06.259.E.OEP; 2017.07.305.E.OEP; 2018.333.E.OEP). The center's administration was informed and the relevant authorizations were passed on to the families. As they were enrolled in groups, it was not possible to carry out a random selection of participants, but this was carried out to structure the groups, ensuring a quasi-experimental design for non-equivalent groups (Campbell; Stanley, 1996). It was advised that classes would be recorded with a fixed camera, with the aim of recording the teacher's verbal interactions during the course of the class. Students received explanations about what the questionnaires would be like and were also asked to answer honestly. They were applied on the first days of class, at the beginning of school. Neither group received information about the objectives of the intervention, which minimized the impact of bias.

A quasi-experimental design was used, in which the control and intervention groups followed the same schedule for 36 weeks and the same learning units were proposed simultaneously. The control group did not follow a different methodological intervention, while the intervention group was implemented through the autonomy-supportive motivational style. In the control group, no initiative was taken to promote student involvement in planning, while

in the intervention group a teaching model based on autonomy support was followed, and the intervention was designed according to the practice preferences collected in the Preference Scale for the Practice of Physical Education - PPEF (Barrachina-Peris; Moreno-Murcia, 2022).

The data obtained were classified into different categories of physical-sports activities, considering criteria related to their nature and structure. For example, activities such as dance, hip-hop, or choreography were grouped under the general category of rhythm and expression. On the other hand, sports such as handball, football, hockey and basketball were included in the category of invasion sports games. Furthermore, activities such as volleyball, beach volleyball, paddle tennis, badminton and *pilota Valenciana* were classified in the generic category of split court, wall and net sports games. Finally, individual activities such as walking, cycling, rollerblading, skateboarding, yoga, relaxation and parkour were grouped into the category of what was generically referred to as individual games and sports activities.

To address the competencies and objectives established by legislation, the teacher proposed another category, being physical fitness related to health and well-being (Devís, 2000; Devís; Peiró, 2001), since it was not initially considered in the preferences of students, arguing the importance of their development in programming. Finally, the situations were linked to the context of the first year, according to the Valencian Community curriculum (Comunitat Valenciana, 2015) and nine learning situations were sequenced, which were equally distributed throughout the course.

The organization and temporal distribution of projects (annual and quarterly) was the result of negotiation and consensus between the teacher and students (most voted preferences), as well as the interaction of several factors intrinsic to the intervention itself (distribution of available spaces), which justified the simultaneous development of two projects throughout the program. The control group did not receive any explanation or justification for the development of the programming.

Considering the formative nature, the initial assessment of skills was carried out in two classes, one to present the situation and answer questions and the other, in which it was developed. Depending on the task, it was organized in parallel, when some groups carried out the assessment task and others did not (self-assessment) or jointly, when the task was carried out simultaneously (co-assessment). This same procedure was repeated at the end of the course.

Prior to the intervention, the lead researcher and an external observer were trained in an autonomy support intervention program (PIAA) (Moreno-Murcia *et al.,* 2021). They held seminars on SDT (Deci; Ryan, 2000), the hierarchical model of intrinsic and extrinsic

motivation (Vallerand, 1997, 2007) and Achievement Goal Theory (Ames, 1995; Nicholls, 1984, 1989). They studied the autonomy-supportive motivational teaching style and the control style (CE) (Reeve *et al.,* 2014; Van Den Berghe *et al.,* 2016) and analyzed the strategies defined in the literature to implement the motivational teaching style (Castillo *et al.,* 2014; Perlman, 2015; Reeve; Cheon, 2016; Sarrazin *et al.,* 2006).

To increase reliability between observers, a university professor specializing in autonomy supported researchers trained in the systematic observation technique (Anguera; Mendo, 2013; Julián *et al.,* 2010). Observation sessions of physical education classes were carried out, which were analyzed independently, with an interval of two weeks, to verify intra-measurement reliability. To analyze interactions, the MEID scale was used (Barrachina-Peris; Moreno-Murcia; Huéscar, 2022). With all this, an inter and intra-observational reliability of 92% was obtained, after several training sessions, which lasted around two months.

During the intervention, the validity of the style adopted by the teachers (control and intervention) was verified by filming several classes (at the beginning, middle and end) and analyzed by the main researcher and the external observer using the MEID scale (Barrachina-Peris; Moreno-Murcia; Huéscar, 2022). Intra- and inter-observer reliability rates were greater than 90%. The impact of the motivational teaching style was analyzed (Table 1), verifying that the validity required in the literature was guaranteed (at least 80% of the behaviors observed) for the use of the motivational style to support autonomy in the intervention group (Perlman, 2015; Reeve; Jang, 2006; Sarrazin *et al.,* 2006).

Table 1 – Video recording of the interpersonal teaching style

		Group control	Intervention group
Take 1	Controller style	91%	3%
	Neutral Style	0%	3%
	Support Autonomy	9%	94%
Take 2	Controller Style	90%	0%
	Neutral Style	10%	10%
	Support Autonomy	0%	90%
Take 3	Controller Style	92%	0%
	Neutral Style	0%	5%
	Support Autonomy	8%	95%

Source: Creation of the authors themselves

To evaluate the effect of group teacher interaction, considering autonomy support (QLCA) and controlling style (QCT), a repeated measures analysis was performed. The results revealed the effect of the autonomy-supportive intervention in the experimental group (M Pre-

test = 5.34 and M Post-test = 5.79, p < 0.05), while no changes were observed in the control style (M Pre-test = 3.47 and M Post-test = 3.64, p > .05), nor in the control group (Autonomy support: M Pre-test = 5.34 and M Post = 5.23, p > .05; Controller style: M Pre-test = 4.25 and M Post-test = 4.29, p >.05).

Data analysis

The analysis of the internal consistency of each factor was carried out using Cronbach's alpha coefficient, and the homogeneity of all dependent variables was verified using Levene's test. The effect of the intervention, as demonstrated in the procedure of this study, was evaluated using a 2 × 2 (× Time Group) repeated measures analysis (ANOVA) with the dependent variable (basic skills). Data analysis was performed using the SPSS 22.0 statistical program.

Results

One-factor analysis of variance was performed, considering basic competence as the dependent variable and the group as a fixed factor, finding differences (Wilks Lambda = .66, F (6, 122) = 10.37, p < .001, η2 = .33) in the controlling style (F = 8.00, p < .01, η2 = .05), with the mean being higher in the control group (M = 4.25; SD = 1.23) than in the intervention group (M = 3.67; SD = 1.19). Differences were also observed in basic skills (F = 47.81, p < .001, η2 = .27), with the mean being higher in the intervention group (M = 2.17; SD = .47) than in the control group. (M = 1.65; SD = .37).

After the intervention (Table 2), the analysis of repeated measures showed that the experimental group had a higher score in basic skills (p <.05).

Table 2 – Non-parametric test of two related samples for competencies

		Intervention group (n = 44)		Control group (n = 71)	
Variables		*M*	*S.D.*	*M*	*S.D.*
Basic Skills	Pre	2.14	.48	1.65	.37
	Post	2.47**	.37	1.68	.40

Source: Creation of the authors themselves
** p < .001

Discussion

The objective of the study was to test whether an intervention based on students' practice preferences, developed through the autonomy-supportive motivational teaching style, improved the development of physical education skills. The results obtained confirm the hypothesis, since the intervention group, which followed a motivating style of autonomy support, improved results in the perception of autonomy support and skills in relation to the control group.

Previous studies point in the same direction (Fin *et al.*, 2019b; Haerens *et al.,* 2013; Hsu; Shang; Hsiao, 2021) and show that Physical Education classes, as a specific social context, combined with the influence that the teacher can have, have a positive influence on students' motivational orientation. According to Ryan and Deci (2000), the social environment in which activities are carried out exerts a significant influence on the disposition or inhibition for such activities, depending on whether basic psychological needs, such as autonomy, competence and relationships with others, are promoted or frustrated.

In this study, the results of the teacher's observation of the intervention group indicated a good level of autonomy support and were also reflected in the students' perception of the autonomy support received. As Reeve and Jang (2006) pointed out, the level of commitment demonstrated by students in the school context is related to the autonomy support provided by the teacher in the classroom environment. Therefore, the more a motivational style that promotes autonomy, structure and relationships with others is used in the classroom, the better the classroom behaviors will be and the lower the perception of control will be, which in turn will boost participation in tasks. However, to ensure the effective implementation of this model in practice, it is necessary to carry out a comprehensive teacher training and evaluation process (Moreno-Murcia *et al.,* 2021).

To date, there is very little evidence relating support to autonomy considering students' preferences in Physical Education classes. Existing intervention studies present the predictive power of autonomy support, psychological mediators, and self-determined academic motivation on core competencies, finding a positive correlation between teacher autonomy support and the development of psychological mediators in students (Fin *et al .,* 2019b; Moreno-Murcia; Llorca Cano; Huéscar Hernández, 2020; Ulstad *et al.,* 2016).

Regarding preferences, a new line of research seems to emerge that relates students' teaching preferences with support for autonomy in Physical Education (Barrachina-Peris; Moreno-Murcia, 2022), however, there are still few existing studies. Jang, Reeve, and Halusic's (2016) results suggest that taking student preferences into account when designing instruction

leads to greater engagement, better conceptual learning, and a more positive perception of autonomy support.

In this study, an instructional design was implemented based on the students' autonomy-supportive motivational style and practice preferences. The results obtained support the positive correlation between support for autonomy and the development of skills. However, in the future, studies should be carried out that delve deeper into this direction, in order to obtain greater consistency in the results obtained.

Final remarks

In conclusion, the results obtained indicate that considering practice preferences in Physical Education and developing instruction through the motivational, autonomy-supportive teaching style improves students' perception of autonomy and key competencies, which is reflected in the functionality of learning and its transfer or orientation to practice. These conditions facilitate the activation or mobilization of resources (cognitive, motor and attitudinal) in the face of an open learning situation or problem situation to be carried out more effectively by students, in the direction indicated by the skills-based approach.

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