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Results of a postural education program, with a gamified intervention vs traditional intervention

Resultados de un programa de educación postural, con una intervención gamificada vs intervención tradicional

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Resumen

La metodología de enseñanza adoptada por el profesorado puede influir en los niveles de participación y aprendizaje del alumnado. El objetivo principal de este estudio fue comparar el efecto de dos programas de intervención de educación postural en función de la metodología utilizada. Un total de 36 estudiantes (19 niñas y 17 niños) de 1º de Educación Secundaria Obligatoria participaron en el estudio. En el primer programa de intervención se aplicó una metodología gamificada, mientras que en el segundo se empleó una metodología tradicional. Ambos programas de intervención se llevaron a cabo a lo largo de 6 sesiones. Se analizaron los contenidos teóricos a través de dos cuestionarios (COSACUES y COSACUES-AEF) y la resistencia muscular a través de tres test físicos (Biering-Sørensen Test, Side Bridge Test y Prone Forearm Plank Test) antes y después de la intervención. Los niveles de motivación (Feeling Scale) y la percepción del esfuerzo (OMNI Scale) se midieron tras cada sesión. Los resultados obtenidos no mostraron diferencias significativas entre las metodologías, pero se encuentran diferencias en términos de género y tipo de metodología. Se demostró que las niñas asimilaban mejor los contenidos con la metodología gamificada. Se encuentra, además, una mayor percepción del esfuerzo y una mayor motivación con la intervención gamificada. Por lo tanto, la aplicación de intervenciones educativas gamificadas por parte del profesorado puede ser una estrategia interesante para aumentar los niveles de motivación y esfuerzo del alumnado.

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Palabras clave
Gamificación; motivación; Educación Física; educación para la salud; postura.

Abstract

The teaching methodology adopted by teachers can influence the levels of participation and learning of students. The main goal of this study was to compare the effect of two intervention programs of postural education according to the used methodology. A total of 36 students (19 girls and 17 boys) in the 1st year of high school participated in the study. In the first intervention program a gamified methodology was applied, while in the second one a traditional methodology was used. Both intervention programs were carried out along 6 sessions. Theoretical contents were analyzed through questionnaires (COSACUES and COSACUES-AEF) and muscular endurance through three physical tests (Biering-Sørensen Test, Side Bridge Test and Prone Forearm Plank Test) before and after the intervention. Motivation levels (Feeling Scale) and perception of effort (OMNI Scale) were measured after each session. The results obtained did not show significant differences between methodologies, but differences have been found in terms of gender and type of methodology. Girls were shown to assimilate better contents with the gamified methodology. There was also a greater perception of effort and greater motivation with the gamified intervention. Therefore, the application of gamified educational interventions by teachers can be an interesting strategy to increase the levels of motivation and effort of students.

Key words

Gamification; motivation; Physical Education (secondary); health education; posture.

Introduction

The Physical Education subject (PE) has the potential to positively and deeply influence the education and development of children and young people in the physical, affective-social and cognitive domains, as well as in the lifestyle. However, these effects are not achieved with just participating in the subject, but there must be a pedagogical intent that supports and ensures the achievement of teaching objectives (León-Díaz, Martínez-Muñoz, & Santos-Pastor, 2019; J. Serrano-Durá, A. Serrano-Durá, & Martínez-Bello, 2019).

Lake (2001) showed that some students experienced feelings of incompetence and frustration through sports and competition. Similarly, Smith and Parr (2007), reported complaints from infants regarding the demands of PE lessons, which were merely oriented towards the physical abilities of the students. Recently, Beltrán-Carrillo and Devís-Devís

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(2019) have supported the results of the aforementioned research by finding that a performance-oriented PE generates negative experiences in boys with obesity and in the less competently motorized girls. Situations that undoubtedly hinder the beneficial effects of the PE subject in the education and development of young students.

In the search for a quality PE, it is a duty of the teaching professionals to provide real motor experiences, with value and transcendence in the students' lives. Therefore, these motor experiences should be able to be extrapolated to their daily lives and to have positive effects on their health (León-Díaz et al., 2019). Tedious curricular content can be a limiting factor for class participation. Thus, it is essential that teachers develop a curriculum that generates motivation. According to the American Psychological Association (APA, 2020), motivation is 'the impetus that gives purpose or direction to behavior and operates in humans at a conscious or unconscious level' (p.1). Motives are commonly divided into primary or physiological, such as hunger, thirst, and need for sleep; and secondary or individual, such as individual interests and targets. An important distinction must also be drawn between internal motivating forces (intrinsic motivation) and external factors, such as gifts or punishments, that can promote or persuade against certain actions (extrinsic motivation). When the motivation is intrinsic, the activity itself provides pleasure (e.g., genuine interest in the subject of PE). As Partovi and Razavi (2019) have recently pointed out, motivation can be a key element of successful academic performance.

Achieving these challenges requires, however, a constant review of the procedures with which PE lessons are taught and learned. Currently, as part of this review of student interests and motivations, gamification is taking a leading role, as its transform traditional teaching performance to try to produce emotionally significant learning through played situations (León-Díaz et al., 2019). One of the aims of gamification is to increase the motivation of students, glancing learning situations and all its elements. Actually, Werbach and Hunter (2012), showed how gamification can generate in the students a significant segregation of dopamine, which intensifies neurological activity, increases the motivation, cognition, attention and the sense of the learning process.

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Gamification seems to be an effective tool for the promotion of physical activity, sports and other healthy lifestyle habits in the school environment (Kostenius, Hallberg, & Lindqvist, 2018; Martín-Moya, Ruiz-Montero, Chiva-Bartoll, & Capella-Peris, 2018; Monguillot, González-Arévalo, Zurita, Almirall, & Guitert, 2015), university (Pérez-López, Rivera-García, & Delgado-Fernández, 2017), and non-school spaces (Johnson, Deterding, Kuhn, Staneva, Stoyanove, & Hides, 2016). Instead, the practice and teaching of activities related to fitness and health should be done through fun and motivational activities.

In this sense, Monguillot et al. (2015) evaluated the impact of gamification as a teaching strategy in promoting healthy habits in high school students. In addition to be effective for increasing motivation and developing healthy habits, it was found useful in the acquisition and consolidation of learning, as well as in the commitment and performance of students. Moreover, Pérez-López et al. (2017) tried to improve the healthy lifestyle habits of university students throw a gamified intervention program. The results of their study showed significant improvements in the habits of students related to diet and levels of physical activity. In addition, Martín-Moya et al. (2018) studied the motivational variations according to the theory of achievement goals through a gamified intervention in high school students, finding that it could be an appropriate educational strategy to encourage healthy habits in a motivating way. Therefore, gamification was a successful methodology for teaching different contents to different age students, so it could be also adequate for teaching postural education to high school students.

The amount of research on gamification in PE remains low (Leon-Díaz et al., 2019), and there have not been investigations into its effect for teaching postural education contents in high school students. With this in mind, the main goal of the current study was to compare the effect of two postural education intervention program, one based in a gamification, and the other one in a more traditional methodology, in high school students.

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Methodology

Participants

A total of 36 students (19 girls and 17 boys), aged between 12 and 13 years, involved in the 1st year of high secondary education in a school in the Valencian Community (Spain) were enrolled in the postural education program. This sample has been obtained from the same school. This age range corresponds to the age at which non-specific low back pain starts to appear (Fanucchi, Stewart, Jordaan, & Becker, 2009).

These students were divided into two experimental groups chosen for convenience: the experimental group 1 (GE1) consisted of 11 girls and 6 boys, while in the experimental group 2 (GE2) it was made up of 8 girls and 11 boys.

GE1: They carried out a postural education intervention program with the use of gamification, and where conceptual, procedural, and attitudinal contents were included, being directed by the PE teacher. This intervention had a total duration of 6 sessions with the same contents as the intervention performed by the GE2.

GE2: They carried out a postural education intervention program with a traditional methodology, which included conceptual, procedural, and attitudinal contents, being directed by the PE teacher. This intervention had a total duration of 6 sessions with the same contents as the GE1.

The inclusion criteria were:

- Participants whose parents signed the informed consent prior to the study.

- Be studying 1st year of high school in their first registration.

- Not have an injury that prevents him from practicing intervention program.

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Excluded were those who did not meet the inclusion criteria above. However, all students performed the proposed intervention group, being those who did not meet the above criteria and who did not participate in this study.

The study protocols and procedures were approved by the Ethics Committee and procedures meet the requirements of Helsinki Declaration of 1964.

Measures

This study with pre and post intervention program with a quasi-experimental design was implemented during 6 sessions.

The assessment of physical and theoretical tests was conducted at the beginning and at the end of the intervention program during the PE sessions.

Data were collected by two theoretical questionnaires, and 3 physical tests. Likewise, the mood state and subjective perception of the effort was recorded during the sessions.

Theoretical content questionnaires.

- Health questionnaire about knowledge for back care related to the physical activities of daily life (Spanish name: Cuestionario de salud sobre conocimientos para el cuidado de la espalda en actividades físicas de la vida diaria –COSACUES–):

COSACUES is a validated questionnaire with a strong internal consistency (α = .82) and an excellent intraclass correlation coefficient (ICC) for the total score (ICC = .76) (Monfort-Pañego, Molina-García, Miñana-Signes, Bosch-Biviá, Gómez-López, & Munguía-Izquierdo, 2016). Likewise, it's only construct aims to know the level of knowledge about health and back care that students have about the use of their body in daily activities. It is composed of 24 multiple-choice questions with four options where only one of them is correct. Through the formula P=(A-F/4-1)/(N/10) an average is obtained among all the students' grades. P is the total test score, N is the sample of the group, F is the number of failures, A is the number of hits, and, finally, B is the number of blank answers.

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- Health Questionnaire about Knowledge for Health and Back Care Related to the Practice of Physical Activity and Exercise for Adolescents (Spanish name: cuestionario de salud sobre conocimientos para el cuidado y la salud de la espalda relacionados con la práctica de ejercicio y actividad física -COSACUES-AEF-):

COSACUES-AEF is a validated questionnaire (Miñana-Signes & Monfort-Pañego, 2015) that aims to measure the knowledge that young people have about health and back care related to the practice of activity and physical exercise. The items refer to knowledge about physical conditioning, muscle strengthening and stretching or joint mobility. This questionnaire is composed of 13 multiple choice questions with three options and only one correct. To extract the final mark of the questionnaire, the following equation was established: P=10*1/N(1*A+B-1/2*F). P is the total test score (with a total of 10 points), A is the number of hits, B is the number of missed values, F the number of failures, and, finally, N is the number of questions. The questionnaire presents an internal consistency of .080 and an ICC = .80.

- Feeling Scale:

The Feeling Scale is a validated assessment scale (Hardy & Rejeski, 1989) that aims to know the different moods of the students during the sessions. In this case, it was carried out to know the motivation towards the methodology used in each intervention applied in the first year of the secondary education. This scale has an interval of -5 to 5, to represent the motivational state of the student against the task and its methodology. This questionnaire was completed after each session of the educational intervention program.

- The OMNI Scale:

The OMNI scale (Rice, Gammon, Pfieffer, & Trost, 2015) measures subjective perception of effort (RPE: Rating of Perceived Exertion) which is presented as a visual descriptor or pictogram where the subject identifies their perception of effort or fatigue on a numerically graded scale during or immediately after the exercise, specifically from 0 to 10. Therefore, this parameter or indicator of effort is inspired and based on the subject's own perception about the degree of fatigue or intensity of the effort you feel, thus reflecting a comprehensive and integrated measure of the level of effort. For its implementation, it has been adapted to Spanish for understanding by students.

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Physical Tests

- Side bridge test:

This test evaluates the resistance of the lateral inclination or flexor muscles of the trunk. Participants should be placed in lateral decubitus on their dominant side on a mat. The foot of the leg of the non-dominant side is placed in front of the foot of the leg of the dominant side, both in contact and supported on the mat, and the hand of the non-dominant arm is placed on the shoulder of the opposite side. In this position, the participants should support themselves with the elbow and the forearm of their dominant side (90º flexion elbow and arm perpendicular to the ground) and raised the pelvis until the trunk was aligned with the lower extremities. The test consists of maintaining the referred position for as long time as possible. The test ends when the student loses the neutral positioning of the pelvis (Juan-Recio, Barbado, López-Valenciano, & Vera-García, 2014).

- Biering-Sørensen test

For the evaluation of the resistance of the trunk extensor muscles, the participants should place in prone position with the lower part of the body resting on a bench and the upper part suspended horizontally, with the arms crossed and the hands in contact with the shoulders (Biering-Sørensen, 1984). The edge of the bench is matched with the anterior superior iliac spines and the legs are fixed to the bench by means of inextensible velcro straps located at the level of the ankles, knees and hips. The test is to keep the trunk in the horizontal position for as long as possible. The test ends when the student loses the horizontal alignment (Baker, 2014).

- Prone forearm plank test

This test measures the resistance of the trunk flexor muscles in an isometric way (Bliss & Teeple, 2005). It consists of keeping the subject's body weight exclusively on the forearms / elbows and toes in a prone position, maintaining a lumbo-pelvic neutral alignment constantly. The arms should be perpendicular to the ground and forming an angle of 90º with the forearms. Elbows and forearms separated shoulder width. The test ends when the student loses the neutral positioning of the pelvis and it falls towards the floor, acquiring a lumbar hyperlordosis by anterior rotation of the pelvis (Strand, Hjelm, Shoepe, & Fajardo, 2014).

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For the physical tests the following protocol was followed: performing three repetitions for each test, with 3 minutes of rest between each repetition, and three minutes of rest between each one, keeping the average of each test (Willardson, 2008).

Procedure

After the signature of the informed consent by the parents of the participants, they were given, and performed the different theoretical questionnaires and field tests in the order shown in the measurements.

In addition, we tried to know the level of motivation and fun towards the methodology used in each experimental group through the Feeling Scale (Hardy & Rejeski, 1989) and the perception of the effort of each session through OMNI Scale.

After this pre-intervention assessment, the intervention of the postural education programme was carried out, and once it was completed, the same tests, questionnaires and tests were carried out with the same order and protocol.

The assessment days were one day before and after the intervention in the PE classes. The 2 intervention programs (gamified intervention and traditional intervention) were carried out along 6 sessions, having a progression between them.

The contents and objectives of each session of each educational intervention program are detailed below (Table 1):

Table 1. Description of the physical intervention programs

Session	Gamified intervention	Traditional intervention
1. General theoretical knowledge.	Development of groups for intervention: board games, etc.	Theoretical presentation in class through a PowerPoint.
2.Postural habits in daily activities	Presentation of the adventure on video (trip to New York); contest through tests in teams that will take them to the codes of the following test.	Mime games, postural careers, postural games, representations of correct exercises using direct command.
3.Postural habits in	Contextualization of the session	Race games for postural

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sports activities	through a video (Trip to ...), Circuit through QR codes for teams with postural contents in sports activities.	purposes, musical games with content on postural education, couples' games with direct command use.
4. Strenght and core exercises.	Contextualization of the session through a video (Trip to ...), realization of a GRAND PRIX, where the teams had to fight each other through tests and points, with aspects related to CORE and strength.	Specific strength and CORE exercises
5. Strenght and flexibility exercises.	Contextualization of the session through a video (Trip to Australia). Scenic representation through day-to-day postural content with flexibility exercises. Evaluation of content worked through the plickers application	Explanation of the importance of stretching, also through traditional games, including flexibility exercises with direct command use. There is also an exercise to look for wally, through stretching.
6. Balance, relaxation and evocation of content.	Contextualization of the session through a video. Realization of an Escape Room, with postural contents, as well as balance and proprioception. Relaxation with music and reflexion.	Proprioception exercises with couples and also with unstable sports equipment. Relaxation and review of contents through a traditional evaluation.

Statistical Analysis

Descriptive statistical analyses were performed (mean and standard deviation) on all variables. Normality of distribution was tested with Shapiro-Wilk and a 95% confidence interval ($p < .05$) was applied in the analyzes. A t-test for related samples was performed to analyze the results of each intervention program and a t-test for independent samples to compare both intervention programs.

The mean differences in each group between Pre and Post were calculated in percentage (Dif. %): [(Mean2-Mean1)*100]/Mean1. Furthermore, to allow a better interpretation of the results, practical significance was assessed by calculating effect size. Effect sizes (ES) were classified as trivial (< 0.2), small (0.2 to 0.6), moderate (0.6 to 1.2), large (1.2 to 2.0), very large (2.0 to 4.0), and extremely large (> 4.0) (Hopkins et al., 2009). The SPSS Statistics v. 22.0 program (IBM, Somers, NY, USA) was used for the treatment and statistical analysis.

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Results

The results of COSACUES, COSACUES-AEF, side bridge test, Biering-Sorensen and prone forearm plank test for the non-gamified intervention group and for the gamification group (Table 2). There are improvements to the side bridge (p = .000 to .014), Bierning-Sorensen (p = .001 to .004) and prone forearm plank (p = .000 to .001) both in students with non-gamified intervention and in the group of students with gamified intervention. In addition, students with gamified intervention have also seen significant differences in the COSACUES questionnaire (p = .000). The gender-based data are presented in table 3. So, we find that there are significant differences in the results of the COSACUES questionnaire in the girls after the implementation of the program (p = .034), however, it doesn't occur in the boys (p = .428) (Table 3).

Within the field tests, the side plank test has differences between gender as there are no statistically significant differences in girls, but in boys (p = .055).

In addition, in boys you also get significant results in the prone forearm plank and the Biering-Sorensen being these p's .015's and 'p' .034 respectively. As for the female gender, in these tests, only significant results are obtained in the prone forearm plank (p = .002).

Table 2. Results of COSACUES, COSACUES-AEF, side bridge, Biering-Sorensen and prone forearm plank for the non-gamified intervention group and for the gamification group.

	Traditional methodology			**Gamification**		
	Pre	Post	Pre-Post TE (Dif. %)	Pre	Post	Pre-Post TE (Dif. %)
COSACUES	4.06 ± 1.45	4.67 ± 1.84	0.3 (15.0)	3.95 ± 1.59	5.74 ± 1.42	1.3 (45.3)***
COSACUES-AEF	1.98 ± 2.41	2.95 ± 1.92	0.5 (48.9)	2.46 ± 2.04	3.46 ± 2.00	0.5 (40.6)
Prone Forearm Plank	56.96 ± 20.80	71.96 ± 25.83	0.6 (26.3)***	57.18 ± 20.03	76.69 ± 32.43	0.6 (34.1)**
Side Bridge	41.38 ± 19.91	49.86 ± 16.83*	0.5 (20.4)*	37.24 ± 15.05	52.43 ± 18.98	0.8 (40.7)***
Biering-Sorensen	91.76 ± 34.88	113.53 ± 38.46	0.6 (23.7)**	68.13 ± 39.37	100.62 ± 35.65	0.9 (47.6)**

Note: * $p \leq .05$; ** $p \leq .01$; ***$p \leq .001$.

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Table 3. Results of COSACUES, COSACUES-AEF, side bridge, Biering-Sorensen and prone forearm plank for the non-gamified intervention group and for the gender-based gamification group.

		Traditional methodology			**Gamification**		
		Pre	Post	Pre-Post TE (Dif. %)	Pre	Post	Pre-Post TE (Dif. %)
COSACUES	B	3.44 ± 1.14	3.89 ± 2.00	0.2 (13.0)	3.66 ± 2.23	5.60 ± 2.08	0.9 (53.0)
	G	4.90 ± 1.45	5.75 ± .86	1.0 (17.3) *	4.11 ± 1.22	5.82 ± 1.03	1.7 (41.6) **
COSACUES-AEF	B	2.55 ± 2.14	3.07 ± 1.93	0.3 (20.3)	3.03 ± 1.40	3.65 ± 2.15	0.3 (20.4)
	G	1.20 ± 2.68	2.78 ± 2.02	0.8 (131.6)	2.16 ± 2.33	3.35 ± 2.01	0.6 (55.0)
Prone Forearm Plank	B	58.95 ± 22.57	72.83 ± 29.57	0.5 (23.5) **	61.79 ± 25.57	90.34 ± 46.07	0.6 (46.2)*
	G	54.23 ± 19.23	70.78 ± 21.55	0.8 (30.5) **	54.67 ± 17.19	69.25 ± 21.18	0.7 (23.5)***
Side Bridge	B	48.03 ± 20.74	56.85 ± 15.50	0.6 (18.3)*	45.51 ± 12.01	63.77 ± 22.06	0.8 (40.1) *
	G	32.23 ± 15.46	40.25 ± 14.24	0.6 (24.8)	32.73 ± 15.06	46.25 ± 14.63	0.9 (41.3)***
Biering Sorensen	B	79.35 ± 38.27	101.61 ± 41.76	0.5 (28.0)*	79.34 ± 36.18	97.36 ± 33.57	0.5 (22.7)*
	G	108.82 ± 21.49	129.93 ± 27.96	0.7 (19.3)	62.02 ± 41.35	102.40 ± 38.21	1.0 (65.1)**

Note: B: Boys, G: Girls; * $p \leq .05$; ** $p \leq .01$; ***$p \leq .001$.

Table 4 presents satisfaction results and RPE in each of the interventions for all participants on the basis of gender. Significant differences were found (p = .001) between both methodologies in both satisfaction and the RPE (Table 4).

Table 4. Satisfaction results and the RPE during the gamified intervention and the non-gamified intervention.

		Traditional Methodology	Gamification	TE (Dif. %)
Satisfaction	Everybody	.02 ± 1.06	3.81 ± .67	5.7 (1895.0) ***
	Boys	-.36 ± 1.23	3.5 ± .64	6.0 (1072.2) ***
	Girls	.54 ± .45	3.98 ± .65	5.2 (637.0) ***
RPE (*Rating of Perceived Exertion*)	Everybody	2.20 ± .75	5.85 ± 1.03	3.5 (165.9) ***
	Boys	1.85 ± .61	5.06 ± .99	3.2 (173.5) ***
	Girls	2.69 ± .68	6.29 ± .78	4.6 (133.8) ***

Note: * $p \leq .05$; ** $p \leq .01$; ***$p \leq .001$.

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Discussion

The objective of the present study was to compare the effect of a postural education intervention program where gamification is used as a methodology, with a postural education intervention programme that has a more traditional character in its methodology and teaching style. As far as our knowledge goes, this is the first study that compares these effects in school-age population.

First, it is necessary to highlight that no significant differences were found between the two methodologies in relation to the improvement of the resistance of the trunk musculature. Thus, the findings of this work show that the application of a 6-session postural education intervention program, whether gamified or non-gamified, is effective in improving the resistance of the trunk musculature. However, when compared by gender, it is found that boys improve in all tests of resistance of the trunk with both methodologies, while girls obtain greater improvements with the gamified methodology. Despite this, other authors have also shown the effectiveness of non-gamified interventions. In this sense, Allen, Hannon, Burns and Williams (2014) and Cabrera-González, Serrano-Durá, Fargueta and Monleón (2020) found that an intervention aimed at improving the musculature of the trunk and core of the students in PE classes produced significant improvements in the resistance of said musculature.

Despite not finding significant differences regarding the improvement in the resistance of the trunk muscles between both methodologies when the class is studied as a whole, significant differences have been found in relation to the learning of theoretical contents about back care in daily activities. When compared by gender, it is noted that gamified intervention shows to be more effective for learning theoretical content in girls, but not in boys. However, these findings should be taken with caution, since other authors have reported significant improvements after performing non-gamified postural education interventions in the theoretical knowledge of the back, the use of backpack and other issues such as proper use of the sofa, sitting properly at home and at school and frequent change of posture at home and at school (Vidal et al., 2013).

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In this study it has also been found that student satisfaction is higher when the intervention that is applied is gamified. This aspect may be of great interest to avoid turning those less competently competent motorists into PE objectors, as indicated by Beltrán-Carrillo and Devís-Devís (2019).

Monguillot et al. (2015), for example, made use of gamification to promote healthy habits in secondary school students and found that it was effective in increasing the motivation, commitment, and performance of students. Martín-Moya et al. (2018) also found that gamification could be an appropriate educational strategy to encourage healthy habits in a motivating way. In this line, Kostenius et al. (2018) also found that gamification was effective in promoting physical activity and learning health-related content in school population between 10 and 12 years. This study, together with the research cited, supports the idea that the use of gamified interventions can be more motivating for PE students.

Finally, the perception of effort has turned out to be higher than average in the gamified intervention. Although we do not know the reasons for these results, since student fatigue has not been measured objectively, it could be due to the fact that not only physiological aspects are worked through the game, but also because the neurological activity as well as attention and cognition are intensified (Werbach & Hunter, 2012). However, more studies are required in order to give a plausible explanation to the data presented here.

Conclusions

The results obtained in the present study show that students assimilate better the conceptual aspects through a gamified methodology. In addition, the implementation of recreational methodologies produces improvements in all the tests and physical tests performed. While boys obtained improvements in all physical tests regardless of the methodology, the girls show greater progress when the methodology is gamified. Finally, the gamified methodology presents a greater satisfaction towards the realization of the sessions of the intervention with respect to the traditional one, equally it obtains a greater perception of the effort. Therefore, the use of a didactic intervention of postural education composed of six

sessions with gamified content allows us to reach, in the short term, the educational objectives with higher levels of motivation and with a greater effort on the part of the students.

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