

Effect of a didactic unit based on competitive games in the motivation, basic psychological needs and enjoyment in Primary Education students

Efecto de una unidad didáctica basada en juegos competitivos en la motivación, necesidades psicológicas básicas y disfrute en alumnado de Educación Primaria

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Abstract

The aim of this study is to analyze the effect of a didactic unit of competitive games based on athletics on self-determined motivation, basic psychological needs and enjoyment in primary and secondary school students within physical education classes. A quasi-experimental pre-post test design was used with a control group. The participants were 98 schoolchildren ($10.40 \pm .50$ years old) from Lugo (Spain). The control and experimental groups consisted of 46 and 52 students, respectively. To measure motivation, basic psychological needs and enjoyment, an ad hoc questionnaire used in other researches was used. The results show significant differences in the control and experimental groups related to the variables intrinsic motivation ($p = .032$); perceived competence ($p = .001$) and relation with others ($p = .011$). Therefore, we can conclude that the didactic unit based on the competitive games in the EF classes caused significant improvements in the different dimensions, compared to those who did not participate, obtaining higher scores both boys and girls.

Keywords

Competitive games; Self-determined motivation; Basic psychological needs; Enjoyment; Physical education; Primary education.

Resumen

El propósito de este trabajo fue analizar los efectos de una unidad didáctica de juegos competitivos basados en el atletismo sobre la motivación autodeterminada, las necesidades psicológicas básicas y el disfrute en escolares de 5º y 6º de Educación Primaria dentro de las clases de educación física. Se empleó un diseño cuasi-experimental pre-post test con un grupo de control. Los participantes fueron 98 escolares ($10.40 \pm .50$ años) de Lugo (España). El grupo control y el experimental estuvieron constituidos por 46 y 52 alumnos respectivamente. Para medir motivación, necesidades psicológicas básicas y disfrute se utilizó un cuestionario ad hoc utilizado en otras investigaciones. Los resultados muestran diferencias significativas en el post-test si se compara de manera global el grupo control y el experimental en la variable motivación intrínseca ($p = .032$), competencia percibida ($p = .001$) y relación con los demás ($p = .011$). Por todo ello, podemos concluir que la unidad didáctica basada en los juegos competitivos en las clases de Educación Física provocó mejoras significativas en las diferentes dimensiones, respecto a los que no participaron, obteniéndose unas puntuaciones superiores en los niños sobre las niñas.

Palabras clave

Juegos competitivos; Motivación autodeterminada; Necesidades psicológicas básicas; Disfrute; Educación física; Educación primaria.

Introduction

Nowadays, if we pay special attention to the high levels of physical inactivity the society is approaching to, it is interesting to search a healthier lifestyle which promotes physical activity practices (Muñoz, Pedraza y Navarro, 2015). In order to do it, is important to know the direct influencing factors at the beginning, during and maintenance of sportive practice, as well as the reasons that lead to constancy or dropout. Within these factors are motivation, satisfaction of basic psychological needs and enjoyment (Barreal-López, Navarro-Patón y Basanta-Camiño, 2015; Navarro, Rodríguez y Eirín, 2016), all of them subject of study of this investigation, focused on academic Physical Education (EF), which is the perfect scene to promote physical activity among boys and girls from early ages.

Regarding current legislation, Organic Law 8/2013, 29 December of Education Quality Improvement (LOMCE) (B.O.E. nº 295) establishes that academic EF should promote healthy habits among the students as well as a regular sportive practice during their free time from the school years and throughout their lives. According to so many investigations about motivation during Primary Education (Castaño-López, Navarro-Patón, Basanta-Camiño, 2015; Navarro, et al., 2016; Trigo-Oroza, Navarro-Patón y Rodríguez-Fernández, 2016), based on self-determination theory (TAD) proposed by Deci and Ryan (1985), also used on a Physical Education context by Soini, Liukkonen, Jaakkola, Leskinen y Rantanen (2007) and Yli-Piipari (2011), among others, it is explained the human being behaviour, its realisation of different activities during their daily life, and its involvement on it, if it is on a free way or conditioned to external factors.

Specifically, it makes a difference between human being behaviour whether it is done by intrinsic motivation or extrinsic motivation; so, it depends on self-motivation of each person at the time of carrying out certain activity without external constraints (Deci y Ryan, 2000) or if it is conditioned to external factors or rewards (Moreno y Martínez, 2006). External regulation differs a lot with the intrinsic motivation, due to the fact that the person has the need of satisfying an external requirement, reward or award at the time of doing the task (Deci y Ryan, 2000). On the other hand, apart from motivation, the lack of demotivation has to be considered, whether it is intrinsic or extrinsic. This theory is the best in order to explain the human being motivation, most of all regarding physical and sportive activities, and so, school EF.

The TAD (Deci y Ryan, 1985) also talks about the existence of three basic psychological needs of each person, which are autonomy, competence and relation with others. If the person gets satisfied these three needs, its intrinsic motivation increases, and develops. Over and above, if these needs are not satisfied, extrinsic motivation and/or demotivation will increase (Moreno, Hernández y González-Cutre, 2009). This way, Deci and Ryan (2000) and Elliot and Dweck (2005) argue that the necessity of autonomy and competence are the main reasons why every person search the satisfaction of these needs through tasks or activities seen as a challenge and also, the fact that intrinsic motivation only is maintained when someone feels competent and autonomous.

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Other authors, such as Moreno and Martínez (2006) assure that the basic psychological needs are something inherent to every person, regardless gender, group or culture, so, if these needs are constantly satisfied, the person will work effectively and will develop in a healthy way; if this does not happen, the person will show signs of illness or bad functioning (Castaño-López, Navarro-Patón and Basanta-Camiño, 2016, Navarro, et al., 2016). In TAD, these needs are the psychological mediators which will have their impact on the three main types of motivation and in turn, will influence aspects like, the emotions, character or attitude, among others (Moreno and Martínez, 2006)

Enjoyment, also related to motivation, is another factor related to exercise and physical activity participation. It is known that it is an important factor for motivation towards school EF, so, the higher it is, the compromise of being positive to it will remain maintained (Gråstén, Jaakkola, Liukkonen, Watt y Yli-Piipari, 2012). In addition it has been demonstrated that when these students enjoy their EF classes, they are more likely to practice physical activity during their free time outside the school (Gråstén et al., 2012).

During EF classes, the enjoyment is related to the student's intrinsic motivation and also to the way in which they perceive their physical competence, specifically according to the beliefs boys and girls have regarding success (Carroll and Loumidis, 2001; Navarro, et al., 2016; Trigo-Oroza, et al., 2016). Then, the entertainment influences at the time of taking a decision to start a physical-sportive activity on a continued way and maintain it along the time once it has been already started (Barreal-López, et al., 2016). So, if the motivation is studied, the satisfaction of the basic psychological needs and the enjoyment of the EF subject, would lead us to know if it is the proper one, or otherwise, it would allow us to contribute as the laws establish regarding academic subjects (LOMCE, 2013).

Accordingly, and based on the proof we have, we believe that there are not investigations which have analyzed specifically the effects of a programme based on competitive games regarding self-determined motivation, the basic psychological needs and the enjoyment of the EF classes on primary education. That is why, the aim of this study was

to analyze the effects of applying a didactic competitive games unit based on athletics regarding the exposed dimensions, and evaluated on a EF classes context. The first established hypothesis was that boys who play these competitive games will show higher punctuation on intrinsic motivation, relation with the others and competence than girls. The second hypothesis we propound is that among the experimental group, boys will show better evolution regarding these dimensions, than girls.

Method

Design

In order to carry out this investigation and give an answer to the established objectives, it was made a longitudinal, descriptive, relational analytical comparative design (Ato, López and Benavente, 2013).

Participants

98 students participated in this investigation (53 boys (54.1%) and 45 girls (45.9%) from the province of Lugo and their ages were between 9 and 11 years old ($M = 9.88 \pm .40$). The selection of the sample was not probabilistic according to the students we had access to. The participants were not assigned to a random group, instead, the groups were the class ones they already had. A control group was established ($n = 46$), with students from 5^o class and 6^o class of primary education, and an experimental group ($n = 52$), made by students of another two groups from the same educative level.

Tools

In order to evaluate the psychological and social aspects of the didactic unit based on competitive games, a multidimensional Scale was used according to enjoyment, competence, relation with others, autonomy, demotivation, intrinsic motivation and extrinsic motivation. It is a questionnaire made *ad hoc* according to Moreno, González, Martínez, Alonso and López (2008); Moreno, González, Chillón and Parra (2008) y Moreno, González and Chillón (2009). The questionnaire is made of 26 items based on a Likert scale from 1 (totally disagree) to 5 (

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totally agree). The first 14 items were headed with the sentence “ When i do activities during Physical Education classes...” they have 4 factors: enjoyment (f.e “ I will have a lot of fun”), relation to others (f.e “I will feel really comfortable with my classmates”), competence (f.e “ I will feel i can do those activities”) and autonomy (f.e “ I will have the chance to pick which way i want to carry the activities out”). The last 12 items were headed with the sentence “ I will participate in the Physical Education classes...” they had three factors: demotivation (f.e: “ But i think i am losing my time”) intrinsic motivation (f.e “ Because Physical Education activities are fun”) and extrinsic motivation (f.e “ Because im told to in school”).

Procedure

In order to carry out this study, the school were asked for permission and then they were deeply informed. Finally, it was obtained the parental informed approval of every single student participating. This investigation was always respectful with the ethical values for studies like this one, under the ethical rules of Helsinki Declaration (1975)

The multidimensional tool was given during EF classes (before and after the intervention) and without the teacher of the subject, in order to avoid any interferences in the students answers. There were given 25 minutes to answer the quiz, and during it it was clarified that it was not an exam, and there were also no correct or incorrect answers. This way, the students would give fearless and honest answers. During the time given to respond, the investigators answered all the doubts that came up about the quiz.

After the quiz was made, the control group continued the class the teacher had programmed, while the experimental group carried out the didactic unit during based on competitive Athletic games for 3 weeks (6 sessions). The structure of the sessions were: information phase, entertainment phase, achievement of goals phase, and a phase in which they cooled down and reflected.

Statistical Analysis

First of all the descriptives were calculated, internal consistency (Cronbach Alfa) and the differences between gender (man; woman) and group (control; experimental). The normality tests (Kolmogorov-Smirnov) showed that the distribution was not normal, using non-parametric tests (Mann-Whitney U) in order to compare variables between group gender and the dimensions of the multidimensional quiz before the intervention. For the post-intervention comparison in the experimental group it was used a Wilcoxon test. The level of significance was established on $p \leq .05$ for the different tests. The analysis were made with the statistics programme IBM SPSS (v. 20.0).

Results

Descriptive analysis, normality and reliability analysis

Table 1 shows the averages and standard deviations of the multidimensional quiz before the study was carried out, and also the normality analysis of the data. The results for the Kolmogorov-Smirnov test indicated that the data did not give a normal distribution. Also, the values of the Cronbach Alpha rate for the control group were ($\alpha = 0.794$) and ($\alpha = 0.707$) for the experimental group.

Table 1

Averages, standard deviations, reliable analysis and internal consistency for each studied variable of the Multidimensional Quiz.

	Control group (n = 46)				Experimental group (n = 52)			
	M	DE	A	K	M	DE	A	K
MI	4.70	.61	-5.53	16.22	4.40	.82	-1.36	1.04
ME	3.34	1.23	-.63	-.66	3.08	1.15	-.041	-.93
DESM	3.76	.55	-1.24	2.39	3.77	.42	-.54	.27
COMP	4.38	.84	-2.42	6.69	4.10	.72	-.60	.91
AUT	4.40	1.02	-2.17	4.42	4.42	.60	-.71	-.58
RELAC	3.81	1.09	-.78	-.21	3.88	.75	-0.20	-.62
DISF	4.51	.068	-2.31	5.59	4.42	.41	-1.26	1.22

Note: M = Average; DE = Standard deviation; A = Asimetry; K = Kurtosis; MI = Intrinsic Motivation; ME = Extrinsic Motivation; DESM = Demotivation; COMP = Perceived competence; AUT = Autonomy; RELAC = Relation with others; DISF = Enjoyment. *p < .05

The analysis indicated that the groups were homogeneous according to the following variables when they reached values of $p > .05$ on ME, DESM, AUT and RELC. This did not happen according to dimensions such as MI ($p = .039$) COMP ($p = .015$) and DISF ($p = .015$).

Análisis de los valores del Cuestionario Multidimensional

Table 2 shows the averages, standard deviations for the pre and post test of the control group and also the experimental group in a general way according to the gender. Due to the not normal data characteristic, not parametric test were used.

Table 2
Averages, standard deviations, reliable analysis and internal consistency for each studied variable of the Multidimensional Quiz.

		Control group						Experimental Group					
		Global (n=46)		Boys (n= 23)		Girls (n=23)		Global (n=52)		Boys (n=30)		Girls (n=22)	
		M	DE	M	DE	M	DE	M	DE	M	DE	M	DE
MI	Pre.	4.70	.61	4.76	.38	4.65	.78	4.40	.82	4.20	.93	4.68	.55
	Post.	4.55	1.07	4.60	1.14	4.50	1.02	4.42	.72	4.26	.83	4.63	.49
ME	Pre.	3.34	1.23	3.33	1.12	3.34	1.36	3.08	1.15	3.36	.95	2.70	1.31
	Post.	2.98	1.39	2.97	1.38	3.00	1.43	2.81	1.13	3.08	.92	2.45	1.31
DESM	Pre.	3.76	.55	3.92	0.43	3.59	.61	3.77	.42	3.61	.43	4.00	.28
	Post.	3.75	.59	3.88	.54	3.63	.63	3.66	.46	3.58	.46	3.78	.45
COMP	Pre.	4.38	.84	4.41	.73	4.53	.62	4.02	.75	4.06	.78	3.96	.71
	Post.	4.53	.54	4.54	.47	4.35	.96	4.10	.72	4.28	.66	3.83	.73
RELAC	Pre.	4.40	.65	4.49	1.02	4.53	.60	4.14	.82	3.95	.81	4.39	.78
	Post.	4.55	.74	4.57	.57	4.31	1.03	4.42	.60	4.22	.67	4.69	.33
AUT	Pre.	3.81	1.09	3.62	1.21	4.01	.96	3.69	.80	3.60	.73	3.81	.88
	Post.	3.84	.95	3.82	.95	3.85	.97	3.88	.75	3.64	.78	4.21	.56
DISF	Pre.	4.51	.68	4.57	.83	4.46	.97	4.42	.41	4.46	.45	4.50	.35
	Post.	4.52	.89	4.60	.49	4.42	.83	4.50	.50	4.63	.61	4.40	.24

Note: M = Average; DE = Standard deviation; A = Asimetry; K = Kurtosis; MI = Intrinsic Motivation; ME = Extrinsic Motivation; DESM = Demotivation; COMP = Perceived competence; AUT = Autonomy; RELAC = Relation with others; DISF = Enjoyment. *p < .05

The results show significant differences on the post-test if it is compared on a general way the control group and the experimental group according to MI ($p = .032$); COMP ($p = .001$); and RELAC ($p = .011$) which did not appear in the pre-test. The comparison of the pre-post test regarding the control group did not show significant statistical differences except ME ($P = 0.031$). If we carry out the same comparison regarding the experimental group, there are significant statistical differences regarding ME ($p = .032$); RELAC ($p < .001$) and AUT ($p = .050$). If we do a comparison by gender in the experimental group we can see that there are significant statistical differences regarding RELAC ($p = .005$) for the boys and for the girls: DESM ($p = .049$); RELAC ($p = .047$) and AUT ($p = .011$).

Discussion

The objective of this investigation was to analyse the effects of a didactic unit during EF classes based on competitive Athletic games about motivation, the satisfaction of the basic psychological needs and the enjoyment of primary education schools. The obtained results, show positive effects of the used method on the experimental group because of the increase after the programme in the MI variable, and the decrease on ME and DESM as the Trigo-Oroza et al., (2016) study shows. Also, the perception of COMP, RELAC, AUT and DISF have increased. These results should be taken cautiously as we are going to see next.

Before the intervention there were significant statistical differences regarding MI, COMP and DISF in favour of the control group. Once the experience was done, there is a decrease on the control group regarding MI and ME, while DESM and DISF stay the same and COMP, RELAC and AUT increase slightly, but not on a significant way. Regarding the experimental group, MI, COMP and DISF increase generally, as the results of Trigo-Oroza et al., (2016) showed, but opposed to Moreno, Cervelló and González-Cutre (2007) and Abos et al., (2015). Regarding ME and DESM they decrease, and RELAC and AUT increase generally. These results show the same as the study carried out by Trigo-Oroza, et al., (2016), Catalina-Sánchez, Fraile-Aranda y Martín-Antón (2009) y Goñi, Ruiz de Azúa y Rodríguez (2004), maybe due to the method used that could motivate more the boys than the girls. This data may have its reason in the fact that the feminine gender, most of all during pre-teenage ages and teenagers gives more weight to competence and social dependence than boys (McCabe y Ricciardelli, 2010). That is why, following Yawen, Dorotthee, Frank y Linda (2013) the EF classes should have equitable contents, and break stereotypes, carrying out methods which promote more self-determined behaviours between boys and girls.

Answering to the aim of this investigation, comparing the perception of the experimental group before and after the didactic unit of competitive games, we can say that, generally, the three variables studied on this group that represent a huge significant statistical difference, are ME which decreases, and RELAC and AUT which increase during the post-test. This

results are similar to the ones given by the study of Trigo-Oroza, et al, (2016) and Navarro, et al. (2016). We consider that these results should be taken account because the satisfaction of the basic psychological needs impacts positively on the MI and this one could also promote the practice of sports in a positive way (Carrol y Loumidis, 2001). Due to the obtained results, we should accept the first hypothesis and in part, the second one.

This investigation shows some limitations and because of this, the data should be interpreted carefully. First of all, it has used only a didactic unit based on competitive athletics games, so another investigation related to other sports should be done, this way we could know what happened to the relation with others variable. Secondly, the selection of the sample was not random but of convenience selected because of the subjects we had access to. That is why, it is necessary to continue this investigation in order to reinforce the motor forced competence and also the psychology of the students (Hortigüela, Pérez y Salicetti, 2015).

Conclusions

The key of this study was to verify the impact of competitive methods on motivation, the basic psychological needs and the enjoyment of EF classes of the primary education students. This competition, when a victory is present, the feeling of perceived competence, enjoyment and intrinsic motivation increases on boys and decreases on girls of these ages. The external regulation, and demotivation decreases for the boys. However, these methods, for girls, make their intrinsic motivation decrease as well as the perceived competence and enjoyment. That is why we consider that EF teachers should know these effects and try to give them positive experiences that will impact on their physical activity practice out of school.

We can conclude that the didactic unit based on competitive games during EF classes caused significant improvements on external motivation (decreasing) and relation with others (increasing) on the experimental group according to the different dimensions, regarding those who did not participate, reaching higher punctuations on boys than girls

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