

CY-ICER2012

Effects of an experimental program to improve the motivation in physical education of Spanish students

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Abstract

The aim was to analyze the impact of an intervention program of physical education (PE) for improvement the motivation among secondary students in Spain. Using the Achievement Goals Theory as a guide framework, two groups were used for the survey: the experimental group ($n=86$), which received 16 lessons of PE based in a mastery climate, and the control group ($n=83$), which received a traditional PE lessons. A program was design following the recommendations of Ames (1992) with the aim of improvement the task orientation and the perception of a mastery climate in PE. Using the 2x2 Achievement Goals in PE Questionnaire and the Learning and Performance Orientations in PE Classes Questionnaire, pre- and post-intervention measures of achievement goals and perception of the climate were measured in both groups. In the experimental group, the statistics analysis showed a significant decrease of the perception of performance climate. The results suggest that the mastery climate in PE can help to promote adaptative motivational profiles of the students.

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Keywords: Achievement Goals theory, physical education, motivation, intervention program.

1. Introduction

Physical education (PE) has been widely tested and shown to play a vital role in promoting public health (Bailey, 2006). So it is essential to promote positive experiences in PE in order to improve the levels of practice and the adherence to physical activity. In this context, the Achievement Goals Theory (AGT) can be helpful in understanding the motivation and the direction of this behaviour (Nicholls, 1989). AGT asserts that the principal purpose for someone to participate in achievement contexts is to demonstrate his or her ability. Accordingly, two basic dimensions of ability have been found: task and ego orientation. The persons who are task-oriented take part in an activity in order to promote their abilities and master the task. On the other hand, the aim of persons adopting an ego orientation is to demonstrate an ability that is superior to that of others. In PE, the task orientation is related to high levels of effort, persistence in the learning, group cohesion, enjoyment and other positive variables.

The dichotomous approach to the goals (task and ego) was extended by Elliot and McGregor (2001) with the dimension approach avoidance. This 2x2 perspective includes four goals: mastery-approach, mastery-avoidance, ego-approach and ego-avoidance.

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AGT provides a theoretical framework with which to analyze the motivational climate in PE and, along this line Standage, Duda and Ntoumanis (2003) affirm that research should improve the students' motivation in PE classes by promoting a task-oriented climate.

Ames (1992) proposed manipulating the six structures of the PE lessons in order to develop a task-oriented climate: task, authority, recognition, grouping, evaluation and time (TARGET). To implement this proposal, the PE teacher has to offer a variety of challenging and interesting tasks to the students. For the authority structure, the teacher should allow the students a certain degree of autonomy in their PE activities. In the recognition structure, the teacher has to recognize the efforts and the individual progress of each student. Teachers should form heterogeneous groups and promote cooperative learning. Each individual's achievements have to be used as the criteria for the evaluation. Finally, the teacher should provide enough time to accommodate the students' different paces of learning.

Some studies have manipulated the motivational climate in PE in order to improve the students' task orientation. For example, Wallhead and Ntoumanis (2004) manipulated the motivational climate in eight PE lessons in Sports Education among high school students in England. Two groups were used: experimental ($n = 25$) and control ($n = 26$). The effects of the intervention were that the students of the intervention group increased their perceived autonomy, enjoyment, effort and competence. In another study, Barkoukis, Tsorbatzoudis and Grougios (2008) measured the effects of the seven-month-long TARGET intervention in PE in 374 high school students in Greece. The students of the experimental group improved their levels of task orientation, effort and perceived competence. In a Spanish high school, Gonzalez-Cutre, Sicilia and Moreno (2011) measured the impact of 26 PE lessons with a task-involving climate in an experimental group ($n = 26$), in comparison with a control group ($n = 20$). The students of the intervention group reported improvements in their task climate perception, mastery approach orientation, mastery avoidance orientation and intrinsic motivation.

Taking these results into consideration, the aim of this study was to examine the impact of an intervention program in PE designed in accordance with the TARGET structures. Improvements of the levels of mastery approach, mastery avoidance and task-involving climate were hypothesized for the students in the experimental group.

2. Method

2.1. Participants

In Spain, 169 high school students (M age = 15.51; $SD = .73$) participated in the study. The experimental group had 86 pupils (36 males and 50 females), and the control group had 83 students (48 males and 35 females). Four PE teachers took part in this study, and they were all males with more than 10 years of teaching experience in PE.

2.2. Measures

2.2.1. Achievement Goals 2x2

The 2x2 Achievement Goals in the Physical Education Questionnaire (Wang, Biddle, & Elliot, 2007), was used to measure the goal orientations of the students. The instrument is divided in four factors: mastery-approach (three items; e.g., 'I want to learn as much as possible from PE class'); mastery-avoidance (three items; e.g., 'I am often concerned that I may not learn all that there is to learn in PE class'); performance-approach (three items; e.g., 'my goal in PE class is to perform better than others') and performance-avoidance (three items; e.g., 'I just want to avoid doing poorly in PE class'). The response scale ranges from 1 (Not at all true) to 5 (Very true). Moreno, Gonzalez-Cutre & Sicilia (2008), have developed and applied the Spanish version with validity and reliability. The Cronbach's alphas for the pre- and post-test measures were .65 and .58 for the mastery approach, .65 and .58 for the mastery avoidance, .78 and .71 for the performance approach and .75 and .74 for the performance avoidance. Due to the

sample size and the small number of items as the scales, the alphas could be considered acceptable (Hair, Anderson, Tatham and Black, 1998).

2.2.2. Perceived Motivational Climate

The Learning and Performance Orientations in Physical Education Classes Questionnaire (LAPOPECQ; Papaioannou, 1994) was used in this survey. The instrument measured two principal factors: the perception of the task-involving climate with 13 items (e.g., ‘the PE teacher is completely satisfied when every student’s skills are improving’) and the ego-involving climate with 14 items (e.g., ‘in this PE class, students try to outperform each other’). The response scale ranges from 1 (Not at all true) to 5 (Very true). Cervello and Jimenez (2001) showed that the Spanish version of the scale is valid and reliable. The Cronbach’s alphas for the pre- and post-test measures were .87 and .86 for task climate and .70 and .67 for ego climate.

2.3. Intervention program

The program was composed of 16 50-minutes lessons (eight weeks, two sessions per week) based on the indications of the TARGET (Ames, 1992). The first six lessons were dedicated to learning games and sports. The following 10 lessons were dedicated to dancing and preparing choreography for gymnastics.

2.4. Designs and procedures

A quasi-experimental design has been employed with pre- and post-test measures repeated in the two groups: control and experimental. Before the implementation of the program, the two teachers who implemented the intervention program in the experimental group were trained in six two-hour sessions. Institutional approval was obtained. The study was conducted in three distinct phases. Firstly, there was a pre-assessment of the variables studied in the two groups. Secondly, the program was implemented in four experimental class groups, as the control groups continued with their traditional PE lessons. Thirdly, once the implementation of the intervention in the experimental group was completed, there was a post-test for both groups.

3. Results

A MANOVA was used for examining the differences between the experimental and control groups in terms of their pre-test scores. Then, a Related Samples *t* Test was used to measure the intervention effects. Finally, the MANOVA was recalculated to check the differences in the post-test scores among the groups.

Multivariate analysis of variance did not show any significant differences between the experimental and control groups in the pre-test scores, except between the ego climate ($F(1,169) = 5.80, p < .05$). This variable is greater in the experimental group.

The scores of the *t* Test (Table 1) of the experimental group showed a significant difference in the perception of the ego-involving climate, a slight decrease of the performance goals, a soft improvement of the mastery goals and a slight growth of the perception of mastery-involving climate. The control groups’ results did not show any significant differences between the pre- and post-scores.

Table 1. Experimental and Control Groups’ Pre- and Post-test Means, Standard Deviations and Student’s *t* Test.

Group	Experimental Group (n = 86)						Control Group (n = 83)					
	T1		T2		<i>t</i>	<i>p</i>	T1		T2		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Mastery-Approach	3.57	.95	3.63	.76	-.499	.619	3.36	1.04	3.59	.84	-1.919	.058
Mastery-Avoidance	3.12	1.05	3.28	.90	1.451	.150	3.20	1.02	3.29	1.02	-.690	.492
Performance-Approach	3.53	1.00	3.33	.94	-1.899	.061	3.61	1.03	3.40	.90	1.868	.065
Performance-Avoidance	3.00	1.11	2.89	.97	.959	.340	2.73	1.08	2.76	1.12	-.307	.760

Task-Climat	3.84	.61	3.89	.64	-.292	.771	3.79	.72	3.64	.66	1.759	.082
Ego-Climat	3.15	.55	2.89	.48	3.955	.000	2.92	.57	2.98	.49	-.909	.366

Finally, the MANOVA did not show any significant differences between the experimental and control groups in the pre-test scores, except between the task-climate ($F(1,169) = 5.81, p < .05$). This variable is greater in the experimental group.

4. Discussion and conclusions

The aim of this study was to examine the impact of an intervention program in PE designed in accordance with the TARGET structures. The results supported the hypothesis relating to the perception of motivational climate. The students of the experimental group perceived a lower level of ego-involving climate after the intervention. This finding indicates that the experimental group's teachers have successfully implemented the TARGET structures (Ames, 1992). These data are in accordance with others' experimental studies (Barkoukis et al., 2008; Gonzalez-Cutre et al., 2011) that report on the positive effects of the implement the TARGET dimensions in the perception of the motivational climate in PE. In this way, it is widely proven that when the situational factors (i.e., the TARGET structures) are firm, they will have a positive impact on the analogous dispositional goal orientation (Church, Elliot and Gable, 2001). However, the measures of the other variables of the study changed from the pre-test to the post-test, but these changes were not significant. Specifically, the mastery goals and the perception of a task-involving climate improved slightly, and the performance goals decreased scarcely. Although the programme was carried out correctly, the results indicate that the intervention was not long enough to get significant effects. Along this line, Digelidis, Papaioannou, Laparidis and Christodoulidis (2003) observed that to obtain the permanent effects on the students' motivation, the task-involving climate should be consistent across years.

The results of the present study have some limitations that have to be resolved by future research. It would be interesting to implement a more durable intervention in order to confirm the significant changes in the variables of this study. Also, it would be useful to know if the impact of the intervention on the students' motivation can be lost after a period with traditional PE lessons.

In conclusion, the results suggest that the mastery climate in PE can help to promote adaptive motivational profiles of the students, in order to increase their levels of practice and adherence to physical activity. These findings also indicate that the interventions have to be prolonged with the aim of consolidating substantial changes in the students' motivation in PE.

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