

Inclusion Teaching Style and Metacognition in Physical Education Classes

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Abstract:

The aim of this study was to examine the impact of inclusion teaching style on increasing students' metacognitive skills in physical education classes. Forty-three students aged 11-12 years participated. The students were divided into two groups: (i) the experimental group consisted of 22 students and (ii) the control group of 21 students. Teachers in the intervention classes used the inclusion teaching styles during the execution of physical education activities and within the control group the command style, was used. Metacognition was assessed pre and post-intervention through semi-structured questionnaires. The results of the statistical analysis showed that students of the experimental group using the inclusion teaching style, applied metacognitive strategies more often than students in the control group. Except that students found the inclusion teaching style more interesting and challenging because they liked to make decisions about the tasks they performed.

Keywords:

Inclusion Teaching Style, Metacognition, Physical Education

1. Introduction

According to Ryan and Deci [1], the more autonomous one person feels, the more satisfaction he feels for what he is doing, and this leads him to higher levels of engagement. Students who are taught in an autonomy-supportive learning environment are more physically active [2]. But most of time students mainly rely on teachers' suggestions to increase their abilities [3]. They do not have an active role in their own learning process and they do not spend time of thinking about learning. Teaching games and sport is a dynamic process that needs complex teaching and learning theory [4]. In sports, aside from the execution of motor skills, there are intellectual components such as knowledge and decision-making. These components are crucial to successful performances in sports.

Many years of previous research has established the critical role of metacognition. Flavell [5] refers that students with high level of metacognition have an awareness of thinking, that means an understanding of thinking tasks and the feeling of what is required to accomplish them and an awareness of thinking strategies and approaches to self-directed learning.

More specifically, the metacognition consists of knowledge of cognition that relates to the learner's awareness of himself, his relationship with the learning task involved and the strategies which the person uses for successful implementation of the task [6]. The other component of metacognition, regulation of cognition includes the: (a) planning, the implementation of the appropriate strategies for effective performance, (b) monitoring their actions during the learning effort, (c) self-evaluation, and (d) reflection in order to correct mistakes in case of failed effort, so the redesign might be more accurate [6,7].

Studies have found that students who use metacognitive abilities, are more autonomous [8], learn and remember more than others [9], use additional strategies to control their motivation [10], and discover the best ways to reinforce what they have learned [8]. So, in effective classrooms, teachers must help students develop their metacognitive skills by incorporating active reflection during their own learning process.

According to Byra [11] student-centered learning is supportive of students' cognitive learning. In student-activated teaching styles, where students employ an active role in the learning process, metacognitive behavior seems to be enhanced [12, 13]. Studies conducted in recent years have shown the effectiveness of student-centered teaching styles in classroom satisfaction and metacognition due to the learner's autonomy in the learning process [13,14], critical skill elements [15,16,17,18] and positive attitudes toward physical activity [19, 20].

In student-activated teaching styles students make a lot of decisions. Specifically, in inclusion style, teacher decides the content of what will be taught, however it allows the students select a level of difficulty and check their own work against criteria prepared by the teacher [21]. This teaching style facilitates equal opportunities for successful performances for all learners regardless of gender, physical or cognitive abilities as students have the chance to work at their own pace [11], and seems to be reflective of more autonomy-supportive teaching behaviors [22].

Researchers found that the inclusion style is effective in skill performance, especially for students of average skill level [18, 23, 24] and has a positive impact on students' motivation and goal orientation [25, 26]. Researchers who examined the motivational effects of the inclusion style in upper elementary-aged students and college students found that the girls reported a preference for this teaching style as they had greater control over what they performed and less anxiety [27, 28]. Byra and Jenkins [29] found that fifth-graders made task decisions as they selected different levels of difficulty according to their perceptions of success and curiosity. However, it has not been examined whether the inclusion teaching style could lead to the development of metacognitive behavior in elementary school students.

So, the aim of this study was to examine how the inclusion teaching style could enhance students' metacognitive behavior in physical education classes. We hypothesized that the inclusion teaching style could develop students' metacognition; according to Byra [11] who mentions that self-evaluation/and self-check strategy are elements of inclusion teaching style and Zimmerman [30] who refers that self-regulated students employ processes like self-evaluation/and self-checking.

2. Materials and Methods

2.1 Participants

Forty-three students, aged 11-12 participated in this research. The students were divided into two groups: (i) the experimental group consisted of 22 students and (ii) the control group of 21 students. Consent for student participation was provided by parents.

2.2 Procedure

All students were taught games. Teachers in the intervention classes used the inclusion teaching style during the execution of physical education activities and within the control group the command style, was used. The program lasted eight teaching hours. In these lessons students were taught how to improve the accuracy of shooting in soccer, basketball, handball, bowling, the accuracy of service in volleyball and tennis, and fitness exercises such as push up and abdominal exercises.

2.3 Intervention Program

Before the intervention program began, the teacher informed the students of the inclusion teaching style. The role of the classroom teacher was to prepare the games and the task sheets (levels of difficulty within each game) observe students' performance and answer questions by the students.

The factors that determined the levels of difficulty were the number, the size, and the weight of the equipment (i.e., small, medium, large balls/hula hoop, etc), the boundaries of the court (small or larger), the distance from a given target (close, in between, far), the rules of the game (strict, relaxed) etc.

Firstly, the game was presented and all students were given a task sheet which explicitly stated the specific factors that determined the level of difficulty. Secondly, the classroom teacher asked from those who choose the same level of difficulty to raise their hands and perform the game in groups. Then, the students were allowed to choose the level of difficulty. Students chatted together to decide on a level, formed small groups and then performed at this level. After the completion of the first trial they could perform the same or another level of difficulty and join another group if they felt that the one they selected was too difficult or not difficult enough.

During this procedure the classroom teacher observed if the students could make appropriate decisions about which level they were capable of performing. At the end of the lesson, students had to write down their scores and goals on the task sheet. Additionally, the classroom teachers were asking students how they felt about the new approach of teaching and if they had any difficulties in making decisions.

A Physical Activity Sample

Name of activity: "kick the ball"

The educators set up four 2 cone goals in each corner of the gym. The distance between the goals is about 1.5 meter. Students may score at any of the four goals. The educators using tape mark 4 starting points. The distance from each starting point to the cone goals are different (2 meter, 3 meter, etc). Volleyballs, soccer balls, tennis balls can be used.

All students are given a task sheet which explicitly stated the specific factors that determine the level of difficulty.

Game Description:

Firstly, students have to choose a ball and line up behind their starting point facing the cones. The first person in each group kicks his/her ball from the starting point and tries to strike the ball between the cones (1 point). The person who kicks the ball in each group goes to the back of the line and each group has a new “kicker”.

At the end of the lesson, students have to write down their scores and goals on the task sheet.

A sample of task sheet based on the inclusion teaching style for students is presented below (Table, 1).

Table 1. Task sheet (inclusion teaching style).

Main goal: To improve shooting accuracy in soccer	
To the students	
1. Choose a distance (distances are marked on the gym floor) and a ball size.	
2. Kick the ball from the start line and do your best to score.	
3. Underline what you are performing	
4. Decide whether to repeat the task at the same level or at a different level.	
Factor 1	Choose a distance (close:2 meter, in between: 3 meters, far: 4,5 meters)
Factor 2	Choose a ball size (volleyball, soccer ball, tennis ball)
Factor 3	Kick the ball with your right foot, with your left foot
How many attempts have you made?	
Write down your score	
Next time I will try to scoretimes on 5 shots	

2.4 Measurement

The metacognitive behavior of students was examined before and after the intervening program with semi-structured questionnaires. Following each of the eight lessons, students placed within the experimental group were instructed to respond to four basic questions. The questions were designed according to the literature on the enhancement of metacognitive activity [31, 32, 33], adapted to the specific activities and related to the use of metacognitive strategies by students (planning, monitoring, evaluation, reflection).

"Before you play a game, do you think about the level of difficulty and the actions/movements you will make in relation to the rules of the game?"(Planning).

"When you play do you notice if you make mistakes? ...If yes...“Do you believe that this action will help you? For what reason? (Monitoring)

"Is/was your performance effective?" (Evaluation).

“When you have to play the same game again what will you change? (Reflection)

2.6 Assessment of Metacognitive Behavior

The answers of the questionnaires were coded by two experts. The answers then categorized into one of the following of the three metacognitive levels.

Low metacognitive level: Students rarely think the game’s difficulty and how to act and when they play they rarely try to observe if they make mistakes. When they have

to perform the same activity again they rarely modify their actions (students use none or just one metacognitive strategy).

Medium metacognitive level: Students sometimes think the game's difficulty of each game and how to act. They sometimes observe their mistakes and when they have to perform the same activity again they sometimes change their actions (students use two strategies).

High metacognitive level: Students very often think the game's difficulty of each game and how to act. They very often observe their mistakes and they try to change their actions when they have to perform the same activity again (students use more than two strategies).

3. Results and Discussion

The answers of the questionnaires were coded by two experts. The responses to the questionnaires were coded (either 1 or 0) by two experts. Responses to questions were coded individually. If a positive response was given about the strategy used, this was coded '1'; negative responses regarding the strategy were coded '0'. The Cohen's kappa coefficient of agreement ($k = 0.87$) showed high reliability (interrater reliability).

Repeated measures analysis of variance which was conducted in order to examine the differences between the initial and final measurement, indicated that the experimental groups showed significantly higher scores than control group on monitoring ($F = 9,873$, $p < .003$, $\eta^2 = .194$), evaluating ($F = 11,385$ $p < .002$, $\eta^2 = .217$), and reflection ($F = 9,34$, $p < .004$, $\eta^2 = .186$). There was no statistically significant difference between groups in planning ($F = 3,326$, $p > .05$, $\eta^2 = .075$). Results from data analysis; means (M) and standard deviations (SD) are presented in Table 2.

Table 2. Descriptive statistics of the two measurements.

	Experimental group				Control group				F	η^2
	Pre-test		Post-test		Pre-test		Post-test			
	M	SD	M	SD	M	SD	M	SD		
Planning	.500	.511	.818	.394	.522	.511	.619	.497	3,32	.075
Monitoring	.363	.492	.863	.351	.333	.483	.428	.507	9,87	.194
Evaluation	.363	.492	.818	.394	.428	.507	.476	.511	11,38	.217
Reflection	.454	.509	.773	.428	.476	.511	.476	.511	9,34	.186.

Descriptive statistics analysis showed that before the intervention program, the experimental group: 40% was marked at the low level, 40% at the middle and 20% in high level, while the control group: 42% was classified at the low level, 38% in the middle and 20% in high. After the intervention in the experimental group 21% was classified at the middle level and 79% at the high level. From the control group, 38% was classified at the low level, 38% on average and 24% at the high level.

In particular, it was observed that the experimental group compared with the control group used more metacognitive strategies, especially monitoring, self-evaluation and reflection. This may be happened because students could choose the tasks they wished to practice and were responsible for their own evaluation.

Students of intervention group reported that the inclusion style helped them to increase their self-esteem because they succeed on their own as they had the freedom

to choose the level at which they will start from. And they felt more autonomous as self-check and decision making were required by the students when the level of difficulty increased. Many of them answered: “Firstly, I like to play on the lowest difficulty... I feel more comfortable...” “I imagine myself playing the game on each level and then I decide in which team I can play with, in order to succeed...”, Sometimes boys selected levels too difficult for them because they were trying to show off their abilities “I think that the first level is too easy for me so I’ll start from the more difficult ...”. But the most students, even the highly skilled were willing to try the different levels of difficulty within a given task because they found it “fun”.

When students read the task sheets with the levels of difficulty they planned their actions according to their abilities. During the self-evaluation students found out where their strengths and weaknesses lied within their performances. The comparison of their performance against the stages helped them to draw conclusions about the effectiveness of their performance in each stage. Evaluating themselves learned how to plan their actions in each stage more effectively. Some students replied: “I had to check my performance because I had to decide at what level I would continue”, “I noticed my mistakes, so I chose to participate in the lower level...” “I observe my own performance, so, I understand which stage is appropriate for me in order to win...”, “I like to check myself because I can see my abilities...”, “When I cannot succeed at a higher level, I do not quit playing... I choose a lower level”. The observation and self-evaluation allowed the students to judge their performance and reorganize their performance by designing the next step; to step backward to a lower level or to step forward to meet a new challenge. So, the task sheets within the inclusion teaching style guided them to make the appropriate decisions, planning for their next steps in order to succeed.

In addition, the environment created was completely different from a typical traditional learning environment. At the end of each lesson the classroom teacher were asking students how they felt about the new approach of teaching. Students found it more enjoyable, interesting, and challenging. In contrast, many students from the control group conceded that they designed their actions but they did not check their performances because they relied on teacher’s feedback and evaluation.

4. Conclusions

Results from the data analysis showed the importance of the use of inclusion teaching style in developing metacognitive behavior. The experimental group compared with the control group used more metacognitive strategies, such as monitoring, self-evaluation and reflection. These findings support the notion that student-activated teaching styles could promote metacognitive skills [13, 34]. Moreover, students found the inclusion teaching style more enjoyable, interesting, and challenging and this had a positive impact on the responsibility and involvement of students in the learning process. These results are consistent with previous findings that this teaching style creates a pleasant learning environment [27, 28, 35].

Based on these findings, inclusion teaching style is a valuable method that helps students become self-directed learners. This teaching style creates a learning environment that allows students to reflect on their own understanding, a focal aim of the educational process [36], and to get enjoyment; an element that has a powerful influence on students’ participation in physical activities [37, 38].

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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