
The Command and Self-Check Styles for more Effective Teaching of Tennis at the Elementary School

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Abstract

The aim of the present study was to evaluate two specific teaching methods for the more effective teaching of tennis at the elementary school. The study included 307 fifth and sixth graders (160 boys, 147 girls) from 7 primary schools of Thessalonica, with age ranging from 11-12 years old ($M=11\pm6$). The students were divided in three groups: a) the first experimental group attended 10 tennis lessons (once a week) based on the command teaching style, b) the second experimental group attended 10 tennis lessons based on the self-check teaching style and c) the control group (with no intervention). Two waves of measurements were conducted (before and after the completion of the intervention) with the use of cognitive variables and motor assessment tests related to the sport of tennis. The test-game, strokes against the wall within 6-meter distance (Majer, 1987), was used in order to examine the effectiveness of the two teaching styles. In addition attitudes toward tennis, and students' intrinsic aspects were also examined. All scales had a high degree of internal consistency ($\alpha > .69$). Results showed that students' belonging to the self-check style group performed better in the motor test and had more positive attitudes toward tennis in comparison to their counterparts of the command style group.. As a conclusion, it is demonstrated that the self-check teaching style can provide more and better solutions in the context of a tennis teaching program, and its implementation can contribute positively to the upgrading of Physical Education at elementary schools.

1 Introduction

A spectrum of teaching methods were introduced by Mosston in 1966, the so-called "Spectrum of teaching styles", which was modified to its contemporary form by himself and Ashworth in 1986.

The primary Principle-Axiom of the Spectrum is that teaching Physical Education is a decision-making process. This axiom leads to the conclusion that there is not only one single teaching method but there are numerous; each teaching method is differentiated by cultivating and meeting different objectives according to who actually the decision-maker is, the teacher or the student. Taking into account the targets we want to achieve, this decision-making process should involve two primary human mechanisms: a) the mechanism of Reproduction, which involves the potential of the person to reproduce what is already known, things that the human being has developed throughout his evolutionary course up to today, e.g. swimming,

long jump, traditional dances etc, and b) the mechanism of Production, i.e. the mechanism which creates things that have not yet been invented, e.g. a new exercise in gymnastics, a new figure on the ice etc (Mosston, 1966). The Reproductive mechanism consists of the following teaching styles: the command style, practice style, reciprocal style, self-check style and inclusion style. On the other hand the Productive mechanism is composed of the guided discovery style, convergent discovery, divergent production style, learner-initiated and self-teaching style.

The Spectrum has provided researchers with a plan so as to systematically study the teaching and learning process in Physical Education. Many studies have been undertaken to examine the effectiveness of the existing teaching styles. However their results were contradictory. Griffey (1983), Locke (1977) and Metzler (1983) attributed to inconclusive results to five methodological shortcomings of past research: a) the insufficient definition of experimental research, b) the inadequate monitoring of research applications, c) the short duration of research periods, not allowing for any change in the learning process, d) the research sample which was composed of college students rather than primary and secondary education students and e) the fact that research was carried out by Physical Education graduates and not by experienced academic researchers. For example, the frequent absence of significant differences among the various teaching styles for acquiring skills is attributed to the inadequate Spectrum research (Metzler, 1983).

The same viewpoint concerning these issues was shared by Goldberger (1992), expert in Spectrum research and consultant for many graduates participating in a number of Spectrum studies. In his review for early Spectrum research, Goldberger draws the conclusion that Spectrum researchers a) managed to systematically verify the style of the Spectrum application, b) had insufficient knowledge about the Spectrum theory, c) their statements were not well-grounded and in proportion to research circumstances and d) the studies were very short in duration not allowing for any changes in the learning process. Even though researchers tried to provide an answer to the unanswered question ("which teaching style is the best?") during this period, the methods they used to discover the answer were problematic themselves.

The main objective of Physical Education, both in primary and secondary education, is to provide children with positive and psychomotor experiences so that after their school graduation they will keep on exercising throughout their whole life (Papaioannou et al, 1999). Taking this into consideration, we realize that the optimal methods and teaching styles to use are the ones which in combination with the appropriate content will aim at encouraging and promoting pupils to be involved with sports during their whole school life.

Until today there has been no research reference about the self-check style and more specifically in teaching style. That is the reason why in this study an effort has been made to compare the self-check style with the command style, which are regarded as the most traditional teaching style in our field. The effectiveness of these two teaching styles was examined according to the acquisition of basic tennis skills. Tennis is a pleasant activity for it contributes to the child's mental and physical balance and health, promotes positive attitudes and, above all, is a sport that can be practiced for a lifetime. The aim was to draw safer conclusions, which will allow for a better and more effective teaching of tennis and the enhancement of learning tennis skills at elementary schools.

2 Method and Procedure

2.1 Participants

307 schoolchildren participated in the study (160 Boys, 147 Girls) from 7 primary schools of Central Greece, aged 11-12 years ($M=11\pm 6$ months). Fifth and sixth elementary graders took part and, according to corresponding studies, these specific age groups are the ones which respond better to the demands of the questionnaire used.

2.2 Experimental Design

The study was carried out on the basis of teaching an interventional physical education program of tennis at the above mentioned elementary schools. The program was planned and implemented during the school year 2003-2004 and its duration was approximately three months.

There were two experimental groups and one control group. Pupils of the one experimental group were taught tennis based on the command style and the second experimental group on the self-check style. In the control group measurements took place at exactly the same time as in the experimental groups, but no intervention at all was made in the intermediate time.

Ten lessons were designed according to the command style and 10 according to the self-check style. The intervention began on October 3rd and was completed on December 15th. The total duration of the teaching program, along with the initial and final measurement, was 12 weeks. The frequency of the lessons was once a week and took place during the physical education lesson.

The interventional program would begin according to the daily teaching plan in both styles, i.e. warm-up, main part and cooling-down; lessons had the same structure and content. What was different was the main part teaching method according to each teaching style. For example, the pupils of the command style group followed and executed the teacher's instructions whereas the self-check group received the same instructions in sketches, performed them on their own and then received the criteria report card for their self-evaluation.

2.3 Measurement Process

Measurements were conducted with the use of motor evaluation tests and questionnaires, once before the implementation of the program and once after the completion of the program. After the end of the practical part, the process of the questionnaire would begin. The pupils were initially informed about the process and special emphasis was placed on the anonymity of the questionnaire. In addition, they were assured about the confidentiality of their answers and the fact that these would be used exclusively within the framework of the specific study. Then the questionnaire was delivered. Before having them fill in the questionnaire, they were provided with the essential standardized instructions and then they had time at their disposal to fill it in a calm, free and independent way.

2.4 Instruments

2.4.1 A. Motor test

The test-game with strokes against the wall within 6-meter distance (performance capacity and stability in tennis) (Majer, 1987) was used to examine the effectiveness of the two teaching styles

Game against the wall within 6-metre distance. Areas with access to a wall were used for the game-test involving strikes against the wall within 6-metre distance. Participants were instructed to hit the tennis ball against a wall and then come back with one bounce and be stroked again, as many times as possible. A line on the wall represents the height of the tennis net. A trial was considered valid if the ball hit the wall above the line and stroked again with one bounce. Three attempts were given and the best was registered.

2.4.2 B. Questionnaires

a) Attitudes. Theodorakis scale (1994) was used to measure students' attitudes toward tennis. Pupils answered according to a scale of semantics differentiation (4-grade scale). Responses were given on a 7 point scale.

b) *Perceived athletic competence.* The Perceived Athletic Competence Scale was used from the Physical Self- Perception Profile (PSPP) by Fox and Corbin (1989), which is composed of 6 questions. This scale has been tested with success in various studies in Greece (e.g. Digelidis & Papaioannou, 1999).

c) *Effort, enjoyment and pressure-tension.* Only three scales with totally 10 questions were used taken from the Intrinsic Motivation Inventory (IMI), by McAuley, Duncan and Tammen, (1989) with reference to: a) effort (4 questions), b) enjoyment (4 questions) and c) pressure-tension (2 questions). These scales have been tested with success in various studies in Greece (e.g. Digelidis & Papaioannou, 1999).

3 Results

3.1 Reliability and Validity

The alpha coefficient was estimated for the examination of the internal consistency of scales. The results showed that the internal consistency of the scales were at acceptable levels (Table 1).

Table 1: Reliability analysis of scales for the initial and final measurements

Factors	Initial measurement α - Cronbach	Final measurement α - Cronbach
<i>Attitudes</i>		
Attitudes towards the tennis sport	.78	.84
<i>Intrinsic motivation</i>		
Effort during PE lesson	.71	.70
Enjoyment during PE lesson	.74	.69
Pressure-tension	.79	.75
Perceived athletic ability	.69	.69

3.2 Effectiveness of the Two Teaching Styles

The statistical package SPSS ver. 12.00 was used for the data analysis. A two-way analysis of variance with repeated measures was implemented to examine the effectiveness of the two teaching styles on the basic tennis skill acquisition. The independent variables were: (a) groups, with three levels: command style, self-check style, and control group, (b) measurements, with two levels: initial-final measurement. The depended variable was the number of correct ball hitting. A t-test followed for assessing the change in attitude with regard to the issues examined.

Game against wall within 6-metre distance. Results showed a statistically significant interaction between the repeated Measurements and the independent variable of Experimental Groups ($F_{1,301} = 63.308, p < .001$).

Statistically significant main effect was found for the repeated factor Measurement ($F_{1,301} = 296.68, p < .001$), as it is demonstrated clearly in Tables 2. Evident is the big difference between the initial ($M = 0.67$) and final measurement ($M = 3.56$). A statistically main effect of the independent factor Experimental Groups was found ($F_{1,301} = 42,884, p < .001$). Scores of pupils belonging to the interventional groups ($M = 4.82$) were clearly higher than the control group scores in the final measurement ($M = 1.2$). Students of the self-check group showed more progress ($M = 5.33$) compared to their counterparts of the command style group ($M = 4.32$).

Attitude towards tennis. Two-way ANOVA derived a statistically significant interaction between the Repeated Factor Measurement and the Experimental Groups ($F_{1,301} = 5.77, p < .05$). In Tables 2, differences are observed between the initial and the final measurement. The scores are clearly better in the final measurement, with the self-check group being much more

positive to the tennis sport ($M = 6.24$) compared to the command style group ($M = 6.06$). As far as the scores of the control group are concerned, these remained at the same high level ($M = 6.09$).

Enjoyment during PE lesson. Results showed a statistically significant interaction among the factors Measurement and Experimental Groups ($F_{1,301} = 4,127, p < .05$). In addition, statistically significant interaction was found between the repeated Measurement and the independent factor Experimental Groups ($F_{1,301} = 3,329, p < .05$). There are differences in Mean Values between the initial and final measurement, as seen in Table 2.

Perceived athletic ability. ANOVA results revealed a statistically significant interaction between the repeated Measurement and the independent factor Experimental Groups ($F_{1,301} = 6,872, p < .001$). Pupils of the command style group ($M = 3.91$) and the self-check group ($M = 3.90$), had a more positive perception of athletic capacity at the final measurement. As far as the control group is concerned, scores were higher at the initial measurement ($M = 3.98$) and more negative at the final measurement ($M = 3.77$).

No statistical differences were noticed for the effort and pressure-tension variables.

Table 2: Mean values, standard deviations of the three groups across the two measurements.

	Initial measurement			Final measurement		
	Command M(SD)	Self-check M(SD)	Control M(SD)	Command M(SD)	Self-check M(SD)	Control M(SD)
<i>Attitudes towards the tennis sport</i>	5.94(.90)	6.19(.77)	6.07(.92)	6.18(.96)	6.29(.90)	6.10(.86)
<i>Intrinsic motivation</i>						
Effort lesson	4.30(.85)	4.35(.70)	4.28(.81)	4.38(.69)	4.33(.76)	4.25(.82)
Enjoyment lesson	4.31(.87)	4.51(.53)	4.34(.64)	4.35(.73)	4.39(.67)	4.48(.51)
Pressure-tension	2.30(1.34)	1.83(1.15)	1.93(1.09)	2.14(1.29)	1.96(1.13)	2(1.2)
Athletic ability	3.73(.84)	3.75(.78)	3.99(.75)	3.92(.84)	3.88(.78)	3.78(.83)
<i>Tennis tests</i>						
Wall game	.28(.37)	.36(.46)	.40(.51)	3.21(2.05)	4.10(2.87)	.55(.77)

4 Discussion

As it has already been mentioned, there had been no references and studies so far with regard to teaching a motor skill with the administration of the self-check style, especially in tennis. Neither has it been proven through research which teaching style provides the best result. In this study, a combination of the self-check style with some basic elements of the reciprocal teaching style was performed. The aim was to create the essential requirements so that the intervention would take place in a climate of cooperation and creativity, the lesson would become more pleasant and enjoyable and more teaching time would be saved for the better assimilation and understanding of learning tennis skills.

It is the first time that reference is made to pupils and the self-check style, a teaching style unknown to teachers and pupils. It was expected that there would be delays in the understanding and performing this style, in contrast to the command style, which is a teaching style that has been used for lots of decades and is teacher-centred, since pupils just watch the teacher and mechanically perform the exercise.

Almost 30 years ago, Mosston (1966) characterised the command style as a teaching method of small value and emphasized the high value of teaching methods involving imagination and creativity. According to Mosston, the concept "value" is perceived as pupils' determination and independence.

For example, within the context of the command style, the pupil does not decide how the lesson is going to take place, a fact that makes him/her depend exclusively on the teacher. On the contrary, according to the reciprocal teaching style, the pupil gets involved in the decision-making process during the lesson. This leads the pupil to independent learning. This is the reason why the reciprocal teaching style was considered to be significant and useful at this time. Of course, the combination that was made does not absolutely fit with any of the teaching styles. On one hand, it will be difficult to compare the results of the study with other similar references in the past and, on the other hand, there are no studies concerning the self-check style.

Studying the differences between the reciprocal teaching style and the practice style for teaching hockey, Gerney (1980) did not mention significant differences. Goldberger, Gerney and Chamberlain (1982) as well as Goldberger and Gerney (1986), found the difficulty grading style effective for the development of pupils' skills, but not so effective as the practice style.

From the analysis of the data, it generally came out that self-check group scores were higher than the performance of pupils of the command style group, without having though statistically significant differences between them in the practical and theoretical tests which were conducted for the completion of the study. However, statistically significant differences were found with the performance of the control group pupils. Generally, the study results demonstrated that both teaching styles help pupils in learning the specific motor skill. There is an evident superiority of the self-check style, something which proves the fact that pupils are always willing and positive for new challenges, skills and teaching methods.

The "game against wall within 6-metre distance" was used to examine the effectiveness of the two teaching styles. This test simulates the games conditions, queries increased abilities, from a technical point of view, and thus may reflect the actual role of the intervention. According to the results, the three-month interventional program showed that there is statistically significant difference between the final and initial measurement, as well as between the scores of the experimental groups and the control group.

Further a great improvement is observed in the self-check group pupils compared to the command style group. Therefore, it can be argued that the self-check group pupils show much more progress in learning tennis skills than the command style group pupils. The specific motor test employed helped to reveal the superiority of the self-check teaching style, because its execution requires a certain degree of difficulty and better tennis technical abilities.

An advantage of the present study over the previous ones is that apart from motor test students' affective reactions to the two teaching styles were also examined. As was expected students' attitudes of the experimental groups were higher than the controls. However, comparison of the two experimental groups showed that the self-check group yielded higher attitudes. This finding provide additional support to the application of the self-check teaching style, suggesting that its effects were not restricted to a better acquisition of a motor skill but also positively influenced students' attitudes.

Enjoyment during the lesson. Differences were found between values of the final and initial measurement. The experimental groups contributed to this.

Perceived athletic ability. With regard to pupils' perceived athletic competence, results reveal mixed perceptions.

Thus, the study results enhance and support the initial hypotheses that experimental group values will be clearly higher than the control group values in the final measurement and that this will be reflected in the more positive attitudes and stronger motivation of pupils taught tennis through the self-check style.

Finally, according to the results, the conclusions drawn from this study are:

With regard to the repeated factor Measurement, statistically significant differences were found among the two measurements of the game against the wall within 6-metre distance and pupils' attitudes towards the tennis lesson.

With regard to the independent factor Experimental Groups, statistically significant differences were found among the three experimental groups in the game against the wall within 6-metre distance and pupils' attitudes towards the lesson of Physical Education.

As far as the interaction between Measurement and Experimental Groups is concerned, statistically significant interaction was found between the repeated factor Measurement and the independent factor Experimental Groups in the game against the wall within 6-metre distance, the enjoyment during the lesson and the perceived athletic competence.

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