

Comparison of Two Intervention Programs through PE Lessons in the Development of Social and Cognitive Skills of 5th-6th Graders

Magkou, A¹., Zetou, E²., Fillipou, F³., Vernadakis, N.⁴

¹Phd Candidate Student,

Department of Physical Education & Sport Science,
Democritus University of Thrace, Komotini 69100, Greece

²Professor

Department of Physical Education & Sport Science,
Democritus University of Thrace, Komotini 69100, Greece

³Professor,

Department of Physical Education & Sport Science,
Democritus University of Thrace, Komotini 69100, Greece

⁴Associate Professor,

Department of Physical Education & Sport Science,
Democritus University of Thrace, Komotini 69100, Greece

Abstract: The aim of this study was to compare the effect of two educational intervention programs in the development of social and cognitive of the Volleyball skill of PE students. Participants were elementary school children from 5th and 6th grade (N=323, 160 boys and 163 girls), aged 10, 11, 12. The students were randomly divided into two groups, the first group followed the Freinet pedagogy program (n=147), while the second group followed a literature program (n=176) using the literary book "The Knight in Rusty Armor" by Robert Fisher. The two intervention programs had a duration of 4 months. The teaching of social skills was combined with a program of learning the cognitive of the Volleyball pass technique. Social skills were assessed with the Matson Evaluation of Social Skills with Youngsters (MESSY-II), I of Matson, Neal, Worley, Kozlowski and Fodstad (2012), as reported in the research of Masadis Fillipou, Derri and Papaionnou (2016), while the cognitive evaluation of the service was carried out with criteria sheet 4 (p. 148) of the 5th-6th grade teacher's Physical Education book. To find the effect of the intervention programs, the non-parametric Friedman test – K related Samples was used as well as the non-parametric analysis Wilcoxon signed-rank test. The results showed that the intervention program with Freinet pedagogy was effective with students showing significant improvement in all factors of social skills: "hostile social skills" ($P=.000$, $Df(1)$, χ^2 : 81.938), "appropriate skills" ($P=.000$, $Df(1)$, χ^2 : 59.559), and "inappropriate assertive behaviors skills" ($P=.000$, $Df(1)$, χ^2 : 47.891). On the contrary, the students of the literature group did not show a significant improvement in social skills. Regarding the knowledge of the pass skill, the students of the Freinet pedagogy group showed a significant improvement in the final and retention measurement. Therefore, the findings support the positive contribution of Freinet pedagogy to the improvement of social skills and also the cognitive of pass skill, through the practice of the intervention program.

Keywords: social, cognitive skills, volleyball, literature, Freinet pedagogy

1. Introduction

Every person from childhood to adolescence and adulthood is involved in a learning process to be able to move in a controlled and skillful way, reacting to the daily and constantly changing demands of the environment (Gallahue & Ozmun, 1998). For successful future participation in sports, the comprehensive development of basic motor skills is necessary (Gallahue & Ozmun, 1995). Childhood is a critical age for the acquisition of basic motor skills which will then be used in specialized sports leading to an increase in children's physical activity (Rose, 1996). Social skills are a very important predictor of social and mental adaptation to the social environment and of the child's development in it are social skills (Gresham, 1988). Priority, according to the Study Guides for both Elementary (Derri, Emmanuilidou, & Vassiliadou, 2011) and High School (Dingelidis, Mylonas, & Papaioannou, 2014) is the development of students' motor skills and through them the improvement of their health and the cultivation of their abilities. Formulating a definition of social skills in terms of its common acceptance is difficult. This is because the determination of social skills is based on a series of psychological factors and characteristics of each individual. These are about personality, intelligence, language, perception and the individual's self-perception, evaluation, general attitude, behavior and interaction with the

environment. The sum of all relevant characteristics, abilities, behavioral elements of each person and their interaction with environment make it difficult to clarify the concept of social skills and their multitude of definitions (Merrell & Gimpel, 2014). The recognition of the value that the development of social skills has for the further psychosocial development of children led the Institute of Educational Policy to the creation of the 21+ Skills Workshops with the creation of excellent integrated material in four thematic cycles and the continuous training of teachers. Lvand Takami, (2015) agree with the above, arguing that the cultivation of social, cognitive and emotional skills is a priority of vital importance in primary and secondary education because social skills contribute to improving and strengthening the physical, mental and emotional health of children.

Additionally, according to the Interdisciplinary Common Curriculum Framework (Interdisciplinary Common Curriculum Framework, 2013) a key purpose of teaching literature is to strengthen students' communication skills and social and emotional development through reading, understanding and interpreting significant works of important Greek and foreign writers. The relationship between literature and sports is proven, which begins almost simultaneously with the appearance of the written word. Since ancient times, famous poets and writers have recorded the stories of winners and Olympians. The relationship between writer and athlete is not accidental, since both experience failure as often as triumph (Theodoropoulos, 2019). The Homeric epics were the starting point of the historical path of sports in literature. The sporting spirit emerged gradually in the Cretan-Mycenaean era (2200-1200 BC) and was later connected with the heroic ideal of the Homeric epics. In the epics of Homer we exist a complete description of sports competitions such as: chariot races, boxing, wrestling, road, sword fighting, discus, archery and javelin.

School performance is affected by many factors related to social and emotional intelligence and the ability to create relationships with peers. Social and emotional skills training is a process in which people learn to behave correctly and responsibly, to create correct relationships with others, to avoid negative behaviors, to recognize and manage emotions, to care and take care of others and making good choices, (Elias, Zins, & Weissberg, (1997). There is evidence that social and emotional skills training is positively related to increased school performance and better grades (CASEL, 2003; Bloodworth, Weissberg, Zins, & Walberg, 2001).

Surveys the effectiveness of Célestin Freinet's Pedagogy is supported by Apostolopoulou, (2017) who found that students after applying Freinet's Pedagogy gained self-activity, self-awareness, and reflexivity. They had, in other words, become aware of themselves, their virtues and even their weaknesses. Also, they had mastered the courage of their opinion and practiced a critical thinking. All this in a democratic environment of the "Class Council" institution. In addition, Lachlou (2016), points out: "With the Freinet pedagogy, the tools and techniques are offered for the development of social skills, communication and cooperation with an emphasis on collective work, democracy and the prevention of violence, the development of responsibility and active participation of the student and the guiding role of the teacher. In other words, the proposal and the tools are offered for a school close to the student, pleasant and creative, but above all a school that can see, even in the long term, a more peaceful, democratic and justice society".

The aim of this study was to compare the effect of two educational intervention programs (Freinet pedagogy and literature) through the Volleyball pass teaching in the development of social skills of PE students aged 10-12 years from 5th and 6th grade. The hypothesis was posed was that the participants of the Freinet pedagogy group, will be better than the participants of literature group, in social and pass skill learning.

2. Method

2.1 Participants

In the research participated 323 5th and 6th grade Primary School students (N=323, 160 boys and 163 girls), aged 10 to 12 years ($MO = 10.97 \pm .70$). Of these, 199 students were studying in the 5th grade, while 124 students were in the 6th grade. The students were randomly divided into two groups, the Freinet Pedagogy group (n=147) and the literature group (n=176). The two intervention programs had a duration of 4 months. A necessary condition for the students' inclusion in the intervention programs was to inform the parents of the students about their child's voluntary participation and to obtain written consent from the parents before the intervention.

2.2 Procedure

The research was carried out by 10 Physical Education teachers who participated voluntarily, having been trained for 6 weeks by the researcher before starting the intervention program. The content of the training for each week was as follows: a) 1st week: Development of Motor Skills in the Physical Education lesson, b) 2nd week: The role of Life Skills in the Physical Education lesson, c) 3rd week: Methods - Teaching style by Mosston, d) 4th week: The role of Music-Kinematic Education in learning, e) 5th week: Goals, Objectives and

pursuits in the Physical Education lesson, f) 6th week: The use of Literature and theatrical play in the Physical Education lessons.

The research was approved by the Institute of Educational Policy and by the Ethics Committee of Democritus of Thrace, Greece. The protection of personal data was ensured with complete anonymity of the teachers and the right to voluntary participation, but also to withdraw from the research at any stage. The permission was announced to all the participating schools in Greece, with the aim of getting the approval of the principals. Before the start of the intervention programs, the teachers of both groups (Freinet pedagogy & literature) completed the Matson Evaluation of Social Skills with Youngsters (MESSY-II), social skills questionnaire for the 1st time. A total of twenty-five (25) teaching sessions were held, divided into one hour each time, while there was the possibility of modifying the program according to the needs and particularities of each school (for example 2 hours X 45 minutes). Upon completion of the program, the teachers completed the Matson Evaluation of Social Skills with Youngsters (MESSY-II) questionnaire for the 2nd time. Also, the students of both groups were evaluated in pass, before, after the intervention as well as two weeks after the intervention without practice (retention).

2.3 Intervention Program

The intervention program with Freinet Pedagogy was based on the "Student Council" institution where the students held a council every six Physical Education lessons. There they discussed all the positive or negative behaviors they noted during Physical Education classes in the printed "Protocol of Correct Sports Behavior". For the "Protocol of Correct Sporting Behavior" four students were assigned by the teacher designated as observers, different for each week. Student observers completed the behaviors with an X (ie, anonymous) for each positive or negative sportsmanship behavior next to the appropriate column, e.g. He plays by the rules of the game, made fun of those who failed, lost his temper, controls his anger, etc. The researcher adapted exercise 13 from the 5th-6th grade student's book in the Physical Education lesson chapter 9, in the "Correct Sportsmanship Protocol" (He plays by the rules of the game, he was kind to the other kids, he lost his cool, etc). Therefore, the goal of the "Student Council" was to engage the students in a process of discussion, exchange of opinions, solving in a creative and cooperative way the problems that arose in the Physical Education course, as well as rewarding the correct sports behaviors and social skills.

Also, every Monday morning the student in charge would stick a wall newspaper in a corner of the classroom. The main sheet was divided into three large columns, with the following titles respectively: "We criticize... We congratulate... We request...". Freinet very characteristically mentions "In this newspaper the students write freely during the week. their complaints, the errors or mistakes they find in their classmates". The sheet "We criticize... We congratulate... We request..." was brought to the "Student Council" by the responsible student. The operation of the council was an innovative process of self-management of students' behavior and cultivation of social skills at school, passing through four stages: propose, discuss, decide, apply, valuable skills for their adult life, which according to Goleman, (2000) they constitute the social capacity of a person to be able to "continually learn how to learn".

The intervention literature program included work plans with physical activities on the topics: Volleyball enriched with proverbs and literary texts from the book "The Knight in Rusty Armor" by Robert Fisher, theater techniques (frozen-dynamic images), painting, contemporary dance and music. The courses aimed at cultivating social skills such as cooperation, anger management, self-knowledge, self-concept, self-esteem, decision-making ability, problem-solving, creative thinking, critical thinking, the ability to effectively communicate.

2.4 Measures

To evaluate social skills, the Matson Evaluation of Social Skills with Youngsters (MESSY-II) questionnaire by Matson, Neal, Worley, Kozlowski and Fodstad (2012) was used, specifically the form mentioned in the research by Masadis et al. (2016) concerns the ages that this paper deals with, in the Greek reality. It is a social skills questionnaire that applies to a wide range of children aged 4 to 18 and is based on the observation of social and antisocial behaviors.

The questionnaire consists of sixty-four (64) questions/statements divided into three factors that investigate three dimensions of social skills: the first factor is called "hostile behaviors" and is composed of twenty-seven (27) questions/statements (e.g. "Gets angry easily"), the second is called "appropriate behaviors" and is composed of nineteen (19) questions/formulations (e.g. "Stands up for others"), and the third factor is called "inappropriate assertive behaviors" and is composed of eleven (11) questions/formulations (e.g. "He thinks he knows everything"). More specifically, this scale is a comprehensive tool that measures various verbal and non-verbal, social and aggressive behaviors and emphasizes children's effectiveness in interpersonal relationships without harming others. To test the validity and reliability of the MESSY II, the questionnaires were completed by the Physical Education teachers of the Primary schools mentioned above. The questionnaire

was created in Google Forms and distributed online. All questions were compulsory. Completing the questionnaire for each student took about 10 minutes.

For the cognitive evaluation of the pass in volleyball, criteria sheet 4 (p. 65) of the Physical Education book of the 5th-6th grade teacher of the Ministry of Education was used. A total of 3 measurements were taken. In particular, the first (initial) measurement was made before the start of the two intervention programs and the knowledge of the service technique from below was evaluated. The second measurement (final) was made on the last day of the intervention and again the knowledge of the service technique was evaluated in the two groups in order to establish the effect of these. The third measurement was made two weeks after the final measurement in order to evaluate the performance/learning retention. The questions for the cognitive assessment of the service were: a) Where on the hand does the ball hit? b) Which leg is in front? c) On which leg is the weight transferred at impact? d) What do we pay attention to in the reception of the service? The answers were given on a scale from "at least" (1), "to a moderate extent" (2), "to a satisfactory extent" (3).

2.5 Statistical Analysis

SPSS 21 statistical analysis package was used, as it is mentioned in section 2.4, for the statistical analysis, the SPSS 21 was employed using a confidence coefficient of $p < 0.005$. A normality test was performed with the Kolmogorov-Smirnov test and showed no normal distribution. For this reason, the non-parametric Friedman test – K related samples was applied to compare each skill of each group in the same measurement as well as each skill of each group separately in each measurement. Since the result was statistically significant, in order to establish any differences between the measurements (post hoc analysis) a comparison was made between the measurement moments with a Wilcoxon matched paired test (before and after for social skills while for the service skill below comparison between initial measurement, final measurement, and retention measurement. Intraclass coefficient was used to test the reliability of measurements on social skills (hostile, appropriate, inappropriate) and serving from below. Values were at satisfactory levels for social skills, and they ranged from .794, .744, .825 and for the Cognitive of pass it was 0.553. The hypotheses of this study were:

(H1) there will be no differences in the students of the two groups (Freinet pedagogy group and literature group) in their social skills between the initial, final measurement.

(H2) there will be differences in the students of the two groups (Freinet pedagogy group and literature group) in their social skills between the initial, final measurement.

(H3) there will be no differences in the students of the two groups (Freinet pedagogy group and literature group) in the knowledge of the service skill between the initial, final and retention measurement.

(H4) there will be differences in the students of the two groups (Freinet pedagogy group and literature group) in the knowledge of the service skill from below between the initial, final and retention measurement.

3. Results

3.1 Social skills

To test for possible baseline differences between groups, analysis of variance (One-Way Anova) was performed on all variables. The results showed that there were differences in the initial measurements of the two groups. For this reason, the non-parametric Friedman test – K related samples was applied to compare each skill of each group in the same measurement as well as for each skill of each group separately in each measurement. The non-parametric analysis Wilcoxon signed-rank test was also used in order to compare the averages of each group (pre-post for social skills, pre-post and retention measure for cognitive of volleyball skills).

After the application of the Friedman test - K related before and after the implementation of the intervention program, the following were found for each factor of the social skills of the two groups:

1) Hostile Skills:

In the Freinet pedagogy group, regarding the factor "enemy skills", there were significant differences ($P = .000$, $Df(1)$, χ^2 : 81.938). To determine any differences between the 2 measurements (before and after), the non-parametric Wilcoxon signed-rank test was used to compare each time period with the previous measurement, where there appeared to be statistically significant differences. The results showed that the participants of the Freinet pedagogy group presented a statistically significant difference between the 1st and 2nd measurements ($P = .000$, $z = -9.395$).

In the literature group, regarding the factor "enemy skills", there were significant differences ($P = .000$, $Df(1)$, χ^2 : 14.582). To determine any differences between the 2 measurements (before and after), the non-parametric Wilcoxon signed-rank test was used to compare each time period with the previous measurement, where there appeared to be statistically significant differences. The results showed that the participants of the

literature group presented a statistically significant difference between the 1st and 2nd measurement ($P=.000$, $z=-4.112$).

2) appropriate skills

In the Freinet pedagogy group, regarding the factor "appropriate skills", there were significant differences ($P=.000$, $Df(1)$, χ^2 : 59.559). To determine any differences between the 2 measurements (before and after), the non-parametric Wilcoxon signed-rank test was used to compare each time period with the previous measurement, where there appeared to be statistically significant differences. The results showed that the participants of the Freinet pedagogy group presented a statistically significant difference between the 1st and 2nd measurements ($P=.000$, $z=-8.639$).

In the literature group, regarding the factor "appropriate skills", there were significant differences ($P=.000$, $Df(1)$, χ^2 : 60.785). To determine any differences between the 2 measurements (before and after), the non-parametric Wilcoxon signed-rank test was used to compare each time period with the previous measurement, where there appeared to be statistically significant differences. The results showed that the participants of the literature group presented a statistically significant difference between the 1st and 2nd measurements ($P=.000$, $z=-7.224$).

3) inappropriate skills

In the Freinet pedagogy group regarding the factor "inappropriate skills" there were significant differences ($P=.000$, $Df(1)$, χ^2 : 56.067). To determine any differences between the 2 measurements (before and after), the non-parametric Wilcoxon signed-rank test was used to compare each time period with the previous measurement, where there appeared to be statistically significant differences. The results showed that the participants of the Freinet pedagogy group presented a statistically significant difference between the 1st and 2nd measurements ($P=0.000$, $z=-8.412$).

In the literature group, regarding the factor "inappropriate skills", there were no significant differences ($P=0.626$, $Df(1)$, χ^2 : 0.237). To determine any differences between the 2 measurements (before and after), the non-parametric Wilcoxon signed-rank test was used to compare each time period with the previous measurement, where it appeared that there were no statistically significant differences. The results showed that the participants of the literature group did not show a statistically significant difference between the 1st and 2nd measurements ($P=0.104$, $z=-1.624$).

Table 1: Pre and post measures of social skills (mean \pm SD).

Social skills	test	Freinet n=147		Literature n=176	
		M	SD	M	SD
Hostile	Pre	2.61	.83	2.14	.75
	Post	1.96	.62	1.99	.68
Appropriate	Pre	3.55	.61	3.44	.71
	Post	4.11	.61	3.76	.62
Inappropriate	Pre	2.51	.88	2.20	.80
	Post	1.98	.67	2.11	.71

Note: SD: Standard Deviation

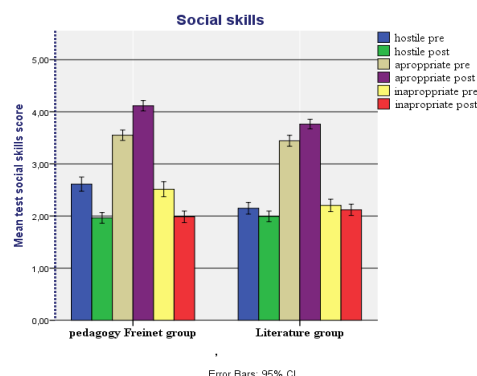


Figure 1: Performance on two measurements across time of the social skills of the two groups.

3.2 Cognitive test of pass

After applying the Friedman test – K related criterion before, after and after the retention measurement after 2 weeks (Table 2) in the cognitive evaluation of the pass skill: 1) the participants in the Freinet pedagogy group presented a statistically significant difference in three measurements ($P=0.000$, $Df(2)$, χ^2 : 24.971). To determine any differences between the 3 measurements (before, after, and maintenance measurement after 2 weeks), the non-parametric Wilcoxon signed-rank test was used where it appeared that there were statistically significant differences.

The results showed that the participants in the Freinet pedagogy group did not show a statistically significant difference between the 1st and 2nd measurements among the three measurements ($P=.058$ $z=-1.896$), while they showed a statistically significant difference between the 1st and 3rd measurements ($P=0.000$, $z=-4.755$), and between the 2nd and 3rd measurements ($P=.004$, $z=-2.895$).

2) the participants in the literature group showed a statistically significant difference in the three measurements ($P=0.000$, $Df(2)$, χ^2 : 62.327).

To determine any differences between the 3 measurements (before, after, and retention measurement after 2 weeks), the non-parametric Wilcoxon signed-rank test was used where it appeared that there were statistically significant differences.

The results showed that the participants of the literature group presented a statistically significant difference between the 1st and 2nd measurement between the three measurements ($P=0.000$, $z=-5.359$), as well as the 1st and 3rd measurement ($P=0.000$, $z=-6.397$), while they did not present a significant difference between the 2nd and the 3rd measurement ($P=.073$, $z=-1.794$).

Table 2: Pre, post and retention volleyball service (mean \pm SD).

Pass	Test	Freinet Group n=71		Literature Group n=158	
		M	SD	M	SD
	Pre	3.73	.94	3.85	.72
	Post	3.95	.71	4.23	.55
	Retention	4.32	.44	4.33	.46

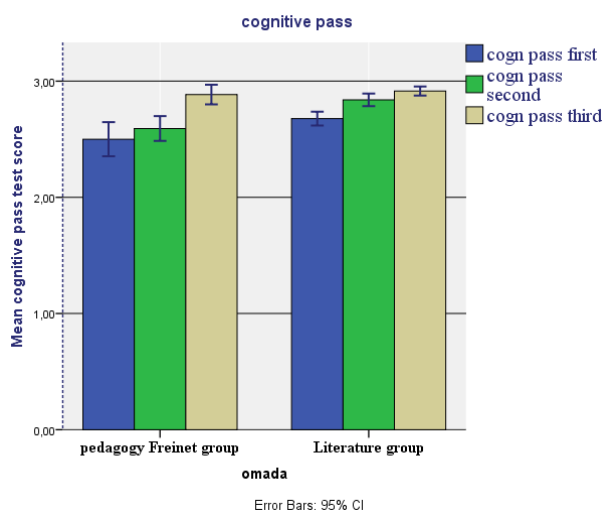


Figure 2: Performance on all measurements across time of the pass of the two groups.

4. Discussion – Conclusions

The purpose of this study was to define the effect of two educational interventions in the development of social skills as well as the improvement of the knowledge of the cognitive pass skill, students aged 10-12 years. The students' social skills were measured before and after the interventions. The students' volleyball pass, was measured before, after the interventions as well as two weeks after the interventions.

The results of this study revealed that students in the Freinet pedagogy significantly reduced "hostile" social behaviors (e.g. complains often, gets angry easily, bullies others, etc.) than students in the literature group who presented small reduction in "inappropriate" behaviors (e.g., being bossy, interrupting others when they are

talking, wanting to be first, etc.) relative to students in the Freinet pedagogy group who improved "inappropriate" behaviors by to a great extent. Also, the students of the second group had very little improvement in "appropriate" behaviors (e.g. helps others, defends them, says "thank you", etc.) compared to the students of the Freinet pedagogy, who increased fivefold the "appropriate" behaviors.

From the results, it appears that the institution of the "Class Council" where the students of the Freinet pedagogy group discussed all the positive or negative behaviors that occurred during the Physical Education lessons had a positive effect on the improvement of the social skills of the students of the group. In the printed "Protocol of Correct Sports Behavior" during the Physical Education lessons four different student-observers per week completed the "hostile", "inappropriate" and "appropriate" social behaviors which were discussed in the "Class Council". With the passing of the lessons, the reduction of "negative" behaviors was seen, while an increase of "positive" behaviors was observed.

Regarding of the knowledge of the pass skill the students of the Freinet pedagogic group showed better results between the 2nd and 3rd measurements, which demonstrates that the program contributed not only to maintaining the knowledge of the technique but also to its improvement even after passing the two weeks old (figure 1). In contrast, students in the literature group showed improvement only between the 1st and 2nd measurement and did not show any improvement between the 2nd and 3rd measurement.

In conclusion, the utilization of the "Correct Sports Behavior Protocol" in combination with the institution of the "Class Council" is an innovative tool, which can be used by Physical Education teachers to improve social and cognitive skills. The research study agree with what Lachlou (2016) claims, "With the Freinet pedagogy, the tools and techniques are offered for the development of social skills, communication and cooperation with an emphasis on collective work, democracy and the prevention of violence, the development of responsibility and the active participation of the student and the guiding role of the teacher. In other words, the proposal and the tools are offered for a school close to the student, pleasant and creative, but above all a school that can see, even in the long term, a more peaceful, democratic and just society".

Regarding the students of the literature group, the improvement of their social skills is in agreement with Solomon, Battistich, Watson, Schaps and Lewis (2000). The researchers, using the reading and discussion of literary texts, implemented a life skills program in the school environment (3) three years for the development of social, moral and intellectual values with positive results even in their academic performance. Students who participated in the literature program improved their social skills as well as their knowledge of service skills, which is consistent with Bloom (1984), who argues that learning has three domains: cognitive, affective, and psychomotor. The cognitive field of learning is linked to the development of cognitive and intellectual skills, which includes knowledge, its understanding, its application in practice, its analysis, synthesis and finally its evaluation (Platsidou, 2010). The results agree with the research results of previous studies regarding social skills. Indicatively, according to Kolovelonis (2011), the Physical Education course can effectively contribute to the development of the social and emotional skills of students, as long as Physical Education courses are designed in such a way that alongside motor and sports skills, they are taught cognitive and behavioral skills that will be useful to students in their all future life later on.

The fact that the literature experimental group improved their social, motor and cognitive abilities is a very important point of the research, which contributes to its innovation, as in the existing literature there have been no studies that have used literature to improve of pass skill knowledge.

Previous qualitative evaluations of life skills programs have given positive results which are in agreement with the results of our own research (Goudas & Giannoudis, 2010; Theofanidis, 2002; Kiorpe, 2002) and reinforce the view that participatory teaching methods and active techniques (such as theater, literature, dance) are appropriate for teaching emotional, social and cognitive skills (Mangrulkar, Whitman, & Posner, 2001). Also, other studies describe skill development through sport and also transfer to other domains (Bean, Kramers, Forneris, & Camiré, 2018; Pierce, Kendellen, Camiré, & Gould, 2018; Pierce, Gould, & Camiré, 2017; Chinkov, & Holt, 2016). It is documented through a wealth of research that students trained in PE in teamwork, brainstorming and problem solving both individually and in groups can thrive in life skills (Gregoriadis, Grammatikopoulos, & Zachopoulou, 2013). The value of a supportive learning environment in improving social, motor and cognitive skills is now scientifically proven since the Physical Education course teaches students how to behave with the rules for positive social behavior (Biddle, Wang, Kavussanu, & Spray, 2003; Filippou, Rokka, & Mavridis, 2016).

A limitation of this research is that it was not applied to Volleyball sports clubs and needs application for better academic skills of Volleyball athletes and pass knowledge. Future research should be conducted with younger or older students to determine if literature can improve emotional and cognitive skills at other ages as well, such as elementary school students as well as middle school students.

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