IMPACT: International Journal of Research in Applied, Natural and Social Sciences (IMPACT: IJRANSS)
ISSN(P): 2347-4580;ISSN(E): 2321-8851
Vol. 4, Issue 6, Jun 2016, 147-158

PSYCHOMOTOR TRAINING PROGRAM WITH ELEMENTS OF THEATRICAL PLAY ON MOTOR PROFICIENCY AND COGNITIVE SKILLS OF PRESCHOOLERS

EIRINI E. SPANAKI[1], ANDRIANA K. GREKIOTI[2] & EMMANOUIL K. SKORDILIS[3]

[1]Special Education, University of Patras, Greece

[2]MA In Tesol: Teaching English to Speakers of Other Languages, University of Nicosia, Nicosia

[3]Associate Professor, Adapted Physical Education, National and Kapodistrian University of Athens, Athens, Greece

ABSTRACT

The purpose of this study was to examine the effect of a psychomotor training program with elements of theatrical play, upon the cognitive skills and motor proficiency of 41 Greek preschoolers who attended in two separate regular schools, in Heraklion, Crete. The two schools randomly served as the experimental - EG (N= 20 students) and control - CG (N=21 students) groups. The Bruininks- Oseretsky Test of Motor Proficiency -Short Form (BOTMP – SF) (Bruininks, 1978) assessed the motor skills, while the ATHENA test (Paraskevopoulos & Paraskevopoulou, 2011) assessed the cognitive skills. The EG followed a ten - week program, twice per week. The program was designed according to the psychomotor development theory (Zimmer, 2007) enriched with theatrical play. 2 X 2 MANOVA, with t-parameter estimates for post hoc comparisons were used for statistical analyses of motor proficiency. Significant interaction effects with respect to 'general motor proficiency' was found. With respect to cognitive skills separate 2 X 2 ANOVAs were used and the results were significant for 'language proportions', 'vocabulary', 'picture memorization', 'distinction of graphs', 'complete proposals' and 'word completion'. The results provided implications for curriculum design, effective teaching and preparing future teachers to work with alternative ways.

KEYWORDS: Psychomotor Training Program, Theatrical Play, Motor Proficiency, Cognitive Skills, Preschoolers

INTRODUCTION

Free game is not sufficient to motor development of children (Barbas, Venetsanou & Kambas, 2014; Manross, 2000; Fisher, et al., 2005). Children in preschool and primary school age need to participate in appropriate movement programs, which should aim to prevent children's future motor disorders. At the same time, these programs target at better preparation for learning. Apart from these, the enhancement of the development of self-esteem and social and emotional skills could be considered essential (Fisher, et al., 2005; Gallahue, 1996; Zimmer, 2007). Additionally, the researchers agree that the organized movement programs are more useful for the cognitive skills of the children than the free motor activities (Pascaul- Leone & Irvin, 1994) and they enhance the significant role of cultivation of language on cognitive skills (Gioti, Derri & Koumourtzoglou, 2006). In that way, the curriculum of kindergarten includes the psychomotor education as a training that supports the holistic development of children (APS, 2005). The effect of psychomotor training programs upon motor proficiency has been examined in the past (Spanaki, Skordilis & Venetsanou, 2010; Trouli, 2008; Zimmer, Christoforidis, Xanthi, Aggeloussis & Kambas, 2008) but the effect upon cognitive skills has not been reported in depth yet. Therefore, the purpose of the present study is an attempt to examine the effect of an organized psychomotor

training program, enriched with theatrical play, on the cognitive skills and motor proficiency of preschoolers. The existence of programs that evolve the mobility of preschoolers and, simultaneously, have a positive impact on cognitive skills are of particular importance in preschool age.

Especially, from the perspective of motor development, Zimmer, Christoforidis, Xanthi, Aggeloussis and Kambas (2008) studied the effect of a psychomotor intervention program on motor performance of 233 Greek preschoolers. The results of the research showed a significant effect of the intervention program to experimental group (EG) and the researchers argued that the particular features of the psychomotor training made the program attractive to children. Additionally, Spanaki, Skordilis & Venetsanou (2010) examined the effect of a psychomotor training program on motor development of 148 primary school students. After the assessment by Bruininks- Oseretsky Test of Motor Proficiency-BOTMP (Bruininks, 1978), the students divided in three groups: a) high, b) average and c) low motor proficiency; also, in experimental (EG) and control group (CG). There was a significant improvement for three groups on gross, fine, fine-gross motor skills and graphomotor skills of EG, in contrast to the lower improvement of the CG, which was participated in the curriculum program.

From another perspective, there are researchers who studied intervention programs as music and motor ones which demonstrated improvement in balance, speed of walking, dynamic balance, rhythm, time and expression of movements. Hamburg and Clair (2002) supported that music is useful for motor development. Gruhn et al. (2003) maintained that a person's musical abilities can interact considerably to the speed of thought. Researchers support that preschool children who participated in a music and motor education program had improvement in the training of motor concepts of spatial orientation, rhythm and reaction time, whereas the same time, seemed to develop creativity and imagination (Derri, Tsapakidou, Zachopoulou & Kioumourtzoglou, 2001; Tsapakidou, Zachopoulou & Zografou, 2001). Additionally, Pavlidou (2001) studied the preschoolers' participation in a program which included a combination of different activities of psychomotor education, such as music-motor, dance and theatrical play. The preschoolers presented significant improvement in their mobility, perception of space and rhythm, but also in understanding instructions, the reproduction of movement, especially in creative movement and, also, in communicative relationships between them. From another perspective, Kouretzis (2008) supported that the theatrical play constitutes a combination of motor activities, using music and expression vectors through imitation, drama or improvisation. The researchers, also, suggest the teaching of psychomotor education and musical reactivity in relation to exercise, in a similar way that the children acquired the motor development, holistically (Trouli, 2008).

Tracing the relationship of motor and cognitive skills of children, Getchell, McMenamin and Whitall (2005) studied the gross motor development of children with learning disabilities and they concluded that the gross motor coordination skills provide important information for early detection of learning disabilities. Subsequently, studies with children with 'non-verbal' learning disabilities (eg. mathematics or writing) showed consequent difficulties of coordination, balance and graphomotor skills (Molenaar - Klumpe, 2002; Rourke, 1995). Getchell et al. (2005) supported that the motor coordination is a reliable criterion for understanding the mechanisms for learning disabilities. Goswami (1996) studied the effect of a variety of cognitive activities designed for 200 children, 8- 15 years old. The results of this research showed that the children who were physically active had better performance in cognitive tests. In addition, Haines (2003) processed data from the catalogs of the National Health Service of G. Britain, where there were files of the results of tests carried out

at children from 4 to 8 years, which aimed at the diagnosis of motor development or learning disabilities. Research results confirmed the existence of a relationship rhythmic ability and motor performance, the performance of language and reading.

Specifically, Gioti, Derri & Kioumourtzoglou (2006) studied the effect of both physical education and language program on 67 preschoolers' knowledge on oral and written speech. The EG participated in a five week- integrated teaching program, while the CG followed the typical preschool program and the EG improved the language elements more than CG. In Greece, Kambas, Amoutzas, Makri, Gourgoulis and Antoniou (2002) studied the effect of a program of psychomotor therapy (PPSA), emphasizing awareness of space and time, and graphomotor development of 35 preschoolers. According to the researchers the EG improved significantly the scores in the tests 'cycle' and 'triangle', during the first analysis unlike the children of CG. Simultaneously, theatrical play has a significant role inside the kindergarten. Furthermore, Tsimpidaki et al. (2014) studied the effect of a theatrical play program on development skills of 8 children with mental retardation (M.O.= 13.7 years old), who participated in theatrical play for 15 times. The program focused on role play in basic life activities (occupations, household activities, sports activities and hospital care) and showed significant offer on basic knowledge for social inclusion, recognition, understanding and expression of emotions and basically, in self- esteem development.

Overall, there is no extensive research on psycho- pedagogical programs with combination of psychomotor training and theatrical play in Greece. Additionally, it seems that there is limited research regarding the effect that psychomotor programs and theatrical play on cognitive skills of children of preschool and primary school age.

METHODS

The Sample

The study was conducted on a sample of 41 Greek preschoolers 19 boys and 21 girls, with an average age of 64.09 months (SD 6.81). Children who participated in this study attended a regular kindergarten program and were not involved in any further sports activities. None of them had any previous experience with the set cognitive tasks and motor tests. All the parents signed a written consent for each child to participate in the study.

The participants attended in two different kindergartens which were randomly selected from the relevant list from the Prefecture of Heraklion. By random selection too, the one constituted the experimental group (EG = 20) and the other constituted the control group (CG = 21) (Thomas & Nelson, 2003) (Table 1).

MEASUREMENTS

Bruininks- Oseretsky Test of Motor Proficiency

Bruininks- Oseretsky Test of Motor Proficiency -Short Form (BOTMP - SF) (Bruininks, 1978) assessed participants' motor proficiency. It is a popular motor assessment battery for children aging 4½ - 14½ years (Kambas, Aggeloussis, Proviadaki, Mavromatis & Taxildaris, 2004; Wilson, Kaplan, Crawford & Dewey, 2000). The BOTMP- SF incorporates 14 items classified under 8 motor areas: 1) running speed and agility, 2) balance, 3) bilateral coordination, 4) strength, 5) upper- limb coordination, 6) response speed, 7) visual- motor control, 8) upper- limb speed and dexterity. According to several research findings, the SF is valid enough to provide satisfactory information about the motor proficiency of children (Broadhead & Bruininks, 1982; Hassan, 2001). Additionally, the above test seems to be a valid test

of motor proficiency in normal Greek preschool and primary school children (Kambas & Aggeloussis, 2006; Kambas et al., 2010; Spanaki, Skordilis & Venetsanou, 2010; Venetsanou, Kambas, Aggelousis & Fatouros, 2006). Venetsanou et al., (2006) assessed the detection of children with motor problems through: a) the BOTMP-SF and b) BOTMP-LF. The researchers found that 72.2% of students with motor problems were identified with both measuring instruments and concluded that these instruments could be used for clinical and research purposes in Greece, provided that the scoring system would undergo certain modifications. Finally, Proviadaki (2004) confirmed the precision and reliability of BOTMP and provided the translated data sheets and the users' guidelines in Greek. The evaluation lasted about 20 minutes for each participant and their performance on the BOTMP –SF can be scored in several ways. Raw scores (like the number of dots made, etc.) are noted, and they are then converted into a numerical point score that compile the total battery composite (Kouli, Avloniti, Venetsanou, Giannakidou, Gazi, & Kambas, 2010).

ATHENA Test

The ATHENA test assessed the cognitive skills of the participants (Paraskevopoulos & Paraskevopoulou, 2011). The test incorporates fourteen individualized diagnostic items evaluating the perceptual, cognitive, and psychomotor processes. It is considered a diagnostic tool of learning difficulties and evaluates necessary development elements for school learning and adaptation (Paraskevopoulos, Kalantzi-Azizi & Giannitsas, 1999). The tool offers a typical diagnostic diagram, which gives important information on the profile of each child tested. It supports the development and implementation of instructive and remedial programs for children, interventions such as supplementary teaching programs etc (Paraskevopoulos & Paraskevopoulou, 2011). The evaluation lasted about 30 minutes for each participant.

For the purposes of the present study, the participants were assessed in nine items: a)‘language proportions ', b) ‘copy shapes’, c) ' vocabulary ', d)' images memorization ', e)' number memorization ', f) ‘complete proposals’, g) ‘ word competition’, h)' distinction of graphs’ and i) 'visual -motor control’. Papanis et al. (2009) stated that the ATHENA is a multidisciplinary test of intra-individual assessment and offers a comprehensive view for critical developmental areas. It identifies areas where the students are lacking, areas that inhibit their ability to respond to the learning requirements, and supports the teaching - therapeutic intervention for students with and without disabilities. Citing the most important factors that influence the choice of this instrument is its adaptation on particularities of the Greek population and the provision of a short form with cognitive items evaluating cognitive skills of children with or without special needs. Also, the creators suggest the Athena test for evaluating cognitive development of children over five years old (Paraskevopoulos & Paraskevopoulou, 2011).

ATHENA Test was constructed and was weighed in the psychometric laboratory of the Faculty of Philosophy, Pedagogy and Psychology, National and Kapodistrian University of Athens, in a process that lasted seven years. Initially it was administered to 500 preschoolers and 660 children aged 5 to 9 years. Triga (2010) examined the validity and reliability of the tool and it was at a satisfactory level.

Statistical Analysis

Separate 2 X 2 factorial ANOVAs evaluated the interaction effect between experimental condition (EG vs CG) and time (pre and post testing), with respect to the cognitive skills of kindergarten students and 2 X 2 MANOVA evaluated the same interaction with respect to the motor proficiency. If the level of F-values was significant in repeated

measurements, the differences of arithmetic means were analyzed with the Bonferroni test for multiple comparisons. The t-test was used to determine the statistical significance of differences in coefficients of reliability and homogeneity of motor tests between the initial and final measurements. Post hoc comparisons were made using p values set at.001. In addition, Eta Squared ($\eta 2$) values were also used for data interpretation (Table 2).

Finally, the reliability of the measurement was performed by the method Intraclass Correlation Coefficient - ICC for the BOTMP was very high (ICC =.925) for the motor proficiency. The reliability was, also, performed by the method Intraclass Correlation Coefficient - ICC for the Athena Test and it was very high (ICC = <. 803 and >.921) for the cognitive skills of preschoolers too.

The Procedure – The Program

Initially, two assessment tools were selected to assess preschoolers' motor proficiency and cognitive skills, respectively. Measurements were taken before the beginning of the intervention program and at the end. The children were individually assessed in the school yard, about their motor performance, according to the BOTMP guidelines (Bruininks, 1978). The examiner was experienced with administration and motor assessment in general. The Athena test was used evaluating the cognitive performance in the classroom. The examiner was educated and experienced with administration.

The EG participated for ten weeks in an intervention psychomotor program with elements of theatrical play, while the CG followed the typical program of the kindergarten. The intervention program was carried out two times per week for 45 minutes each time. Based on the results of the initial evaluation, the design of the intervention program was made. It was instructed by an expert on Zimmer's pedagogical approach of the Psychomotor Training philosophy (2007) and included elements of theatrical play (Kouretzis, 1991). The scheduling of the present intervention program incorporated teamwork activities with playful elements. Significant characteristics of the above program were the contact and the communication between the children who participated as well as the encouragement and the animation of participants. Simultaneously, the participants had chances to be self activated through tasks which generated concerns.

Indicatively, in the courtyard there was a scene with bricks and boxes or objectives for darts, chairs (material of psychomotor training) etc. According to a myth that the kids animated, they shared "roles" and were required to make motor choices. They walked or rolled, ran around or jumped through hoops, made balance in bricks etc. Participants were encouraged to act according to their imagination, initiative and their inspirations. They had the choice to decide on the way they would participate. The myth intended to encourage all children to participate in activities (for example: Treasure Hunt: "All the pirates found a way to move along the paths in order to find their treasure ") (Intervention Program is represented in Table 3).

At the end of the experimental procedure the re-evaluation on motor proficiency and cognitive skills of all participants (EG and CG) followed, by the same research tools which was used for the initial assessment.

RESULTS

A significant interaction effect was found with respect to the 'general motor proficiency' of the preschoolers (Λ =.462, F = 45.397, p =.000, η^2 =.538) (Figure.1). With respect to children's cognitive skills, the univariate analyzes yielded significant interaction regarding 'language proportions' (Λ =.668, F = 6.119, p =.002, η^2 =.332) (figure. 2), 'vocabulary' (Λ =.547, F =.10,229, p =.000, η^2 =.453) (figure. 3), 'picture memorization'(Λ =.776, F = 3.555, p =.023, η^2 =.224) (figure.4),

'distinction of graphs' (Λ =.807, F = 2.945, p =.045, η^2 =.193) (figure. 5), 'complete proposals'(Λ =.633, F = 7.151, p =.001, η^2 =.367) (figure.6) and 'word completion' (Λ =.649, F = 6.659, p =.001, η^2 =.351) (figure. 7). For post hoc comparisons, t- tests were significant for the 'vocabulary' (1^{η} measurement: t= -1.945, p=.059, η^2=.088, 2^{η} mes.: t= 1.986, p=.054, η^2=.092), and the 'word completion' (1^{η} mes.: t= -2.060, p=.046, η^2=.098, 2^{η} mes.: t= 1.910, p=.063, η^2=.086).

DISCUSSIONS

The current research studied the effect of a psychomotor intervention program with elements of theatrical play upon preschoolers' motor proficiency and cognitive skills. The results obtained in this study showed a statistically significant improvement for both motor proficiency and cognitive skills of the experimental group. A significant interaction effect was found with respect to the 'general motor proficiency' of the participants. Additionally, the children of the experimental group showed significant improved performance in six out of the nine cognitive items that were studied. On the contrary, the children who participated in the control group did not perform significantly better in the post-measurement than in the pre-measurement, in any test.

That finding is consistent with previous studies that examined the effects of motor/ psychomotor intervention programs upon motor proficiency (Spanaki, 2008; Spanaki, Skordilis & Venetsanou, 2010; Zimmer et al., 2008 etc). Spanaki et al. (2010) supported that there was a significant interaction between the intervention program of psychomotor training and the motor proficiency of the EG. Additionally, the results of the present study are in accordance to Pavlidou (2001) who studied preschoolers' participation in a program which included a combination of different activities of psychomotor education, such as music-motor, dance and theatrical play.

Regarding cognitive development, the results of the present study shed light on the views of researchers who had pointed the relation between motor and cognitive skills (Gioti et al., 2006; Gethell et al., 2005; Haines, 2003; Kambas et al., 2002; Pascual – Leone & Irwin, 1994; Tsimpidaki et al., 2014). Pascual – Leone and Irwin (1994) highlighted the importance of the organized motor program and supported that a structured program increases the children's activation level on cognitive skills. In addition, Haines (2003), also, found a relationship between gross motor skills performance in auditory verbal comprehension and language tests, from the catalogs of the National Health Service of G. Britain.

Furthermore, Gioti et al. (2006) found that children who participated in physical education and language program improved the language elements after the application of the program. Kambas et al. (2002) supported the effectiveness of psychomotor training on graphomotor development of preschoolers.

The present study supports the significant role of the intimacy between psychomotor education and theatrical play. Researchers insist on the close relation between the above psycho pedagogical approaches and they think about them like specific ways to attach holistically preschoolers and primary students, with or without special needs (Kouretzis, 1987; 2008). Tsimpidaki et al. (2014) highlighted the effect of the theatrical play on general development of children with special needs, emphasizing on knowledge for social inclusion. Simultaneously, it should not be forgotten the psychomotor training and the theatrical play have a significant role inside the kindergarten. The theatrical play can support the communication between the preschoolers, the smooth integration of the child in the group nursery and the development of child's skills (Bourneli, 2002).

However, several limiting factors do not allow generalization of the present findings without caution. There was no possibility to make two groups (EG and CG) that would include preschoolers mixed from two different classes (randomly), but on the contrary, the groups were unchanged parts of the classes, because the program took place within school hours. But the demographic characteristics of participants in the two groups was attempted to be roughly similar. Additionally, the participants were from two kindergartens only and there is need to repeat this intervention program in larger sample population in order to generalize. Additionally, the improved performance upon cognitive skills of the children of EG, in the post-measurements might be due to the instructions that were given to them during the program. For that reason, it is possible that the children had more improvement on cognitive skills in the second measurements. Overall, this aspect is supported by other researchers who emphasize the importance of cognitive information in the performance of motor skills (Barnhardt et al. 2005; Case-Smith, 2002; Jongmans et al. 2003). However, it became an attempt to delimitate some environmental factors. The parents and the teachers had been advised that participants in the program couldn't participate in such extracurricular activities (sports, art, theater etc.) during the ten weeks.

In future, it would be useful to study the effect of psychomotor program with elements of theatrical play, implementing it with preschoolers/ students with special educational needs, such as children with Learning Disabilities, chronic diseases, mental retardation, even emotional problems or even in groups with movement/ developmental difficulties (DCD, ADHD). Indeed, an intertemporal study which would be based on the scale of difficulty in motor proficiency and cognitive skills and which would have repeated measurements of the participants' abilities would be interesting. Remarkable would be a comparative study of different intervention programs, for example, psychomotor, or motor- music, motor- drama etc. and their effect on all-round development of children. Also, a research design could be established that includes follow up measurements, after a certain period of time from the program, to determine whether students' improvement was maintained or not.

CONCLUSIONS

Based on the aforementioned findings, it is important for preschool teachers and physical educators to know that the implementation of psychomotor training, enriched with theatrical play, in preschool age contributes not only to the improvement of children's motor proficiency but also supports cognitive skills. Also, the teachers ought to have in mind alternative ways to support students' learning through interventions in their skills development from an early age. Particular attention should be given in the way that the teachers, physical educators and preschool teachers would provide an alternative program within the framework of early intervention on the students' motor proficiency and cognitive skills. Overall, taking into consideration the effectiveness of the present program both on motor proficiency and cognitive skills, there is importance to compare it with other methodological approaches.

Table 1: Students' Demographics

	Means (Months)	SD	N
General Schools	64.09	6.81	41
EG	61.63	7.08	19
CG	66.22	5.92	22
Boys			19
Girls			22

Table 2: 2 X 2 ANOVA Interaction between the Intervention Program and the Time

Subtests	Λ	F	p	η^2
Total score of BOTMP- SF	.462	45.397	.000	.538
Language proportions	.668	6.119	.002	.332
Vocabulary	.547	10.229	.000	.453
Picture memorization	.776	3.555	.023	.224
Distinction of graphs	.807	2.945	.045	.193
Complete proposals	.633	7.151	.001	.367
Word completion	.649	6.659	.001	.351

Table 3: Example of Program

Role- myth	Development - Motor activities	Materials
'Pirates and the treasure'	Gross motor development- movements in different ways (balance, walking on tiptoe etc)	Chairs, boxes, mattress, tables, gymnastic hoops etc.
'Athletes in races with obstacles'	Gross motor development – jumps, running, crawling on the ground, turning etc.	Cords, automobile tires, exercise mat, bowling fitness etc
'River races'	Perception of space and body- activities of bilateral coordination	Flagpoles fitness, cylindrical soil pipe, automobile tires, paddle boat etc.
'The planets into the square of the universe'	Perception of space- Shapes with the body- balls, spinning tops, triangles, squares and diamonds	Balls, gymnastic hoops, bares, big boxes etc.

FIGURES

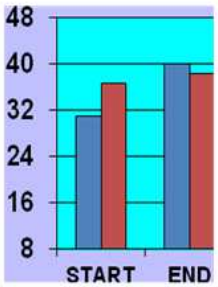

Figure 1

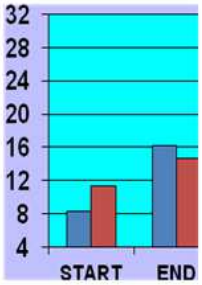

Figure 2

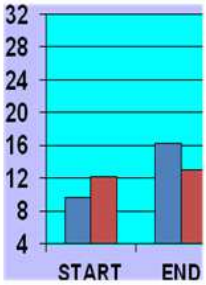

Figure 3

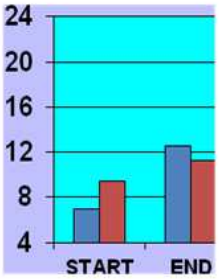

Figure 4

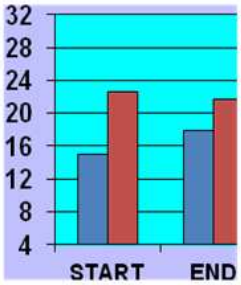

Figure 5

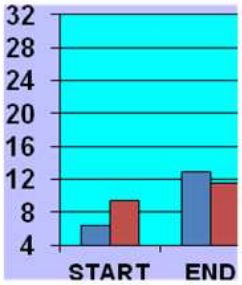

Figure 6

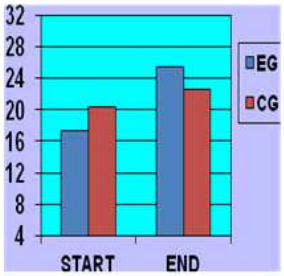

Figure 7

REFERENCES

1. Barbas, I., Venetsanou, F. & Kambas, A. (2014). Games with physical contact. Playful activities for all contact sports for children from 6-12 years. Kavala: Ed. Shuttle.
2. Barnhardt, C., Borsting, E., Deland, P., Pham, N. & Vu, T. (2005). Relationship between visual-motor integration and spatial organization of written language and math. *Optometry and Vision Science*, 82(2), 138-143.
3. Bruininks, R. H. (1978). *Bruininks-Oseretsky Test of Motor Proficiency.* Minnesota: American Guidance Service.
4. Bourneli, N. (2002). Motor Creativity. Special Program for the Development of Motor Creativity for Kids. Athens: Alfa Status.
5. Case-Smith, J. (2002). Effectiveness of school based occupational therapy intervention on handwriting. *American Journal of Occupational Therapy*, 56, 17-25.
6. Derri, V., Tsapakidou, A., Zachopoulou, E., & Kioumourtzoglou, E. (2001). Effect of a music and movement programme on development of locomotor skills by children 4 to 6 years of age. *European Journal of Physical Education, 6,* 16- 25.
7. Fisher, et al., 2005 Fisher, A., Reilly, J., Kelly, L., Montgomery, C., Williamson, A., & Paton, J. (2005). Fundamental movement skills and habitual physical activity in young children. Medicine & Science in Sports & Exercise, 37, 684–688.
8. Gallahue, D. L. (1996). *Developmental physical education for today's students.* Dubuque, IA: Brown & Lunchmark.
9. Getchell, N., McMenamin, S., & Whitall, J. (2005). Dual motor task coordination in children with and without learning disabilities. *Adapted Physical Activity Quarterly, 22,* 21- 38.
10. Gioti, E., Derri, V. & Kioumourtzoglou, E. (2006). Preschoolers' Linguistic Development through Physical education**.** *Inquiries in Sport & Physical Education, 4 (3),* 371 – 378.
11. Goswami, U. (1996). *Analogical Reasoning and Cognitive Development. Advances in Child Development and Behavior* (pp. 92-135). San Diego, CA: Academic Press. Goswami, U. & B.
12. Gruhn, W., Galley, N., Kluth, C. (2003). *Do Mental Speed and Musical Abilities Interact?* N.Y. Academy Music Education Department & University of Music: Freiburg.
13. Hamburg, J., & Clair, A. A. (2003). The effects of a laban- based movement program with music on measures of balance and gait in oldel adults. *Activity Adaption Aging, 28,* 17- 33.
14. Haines, C. (2003). Sequencing, co- ordination and rhythm ability in young children. *Child: Care, Health and Development, 29 (5),* 395- 409.
15. Jongmans, M.J., Linthorst-Bakker, E., Westenberg, Y. & Smits-Engelsman, B.C.M. (2003). Use of a task-oriented self-instruction method to support children in primary school with poor handwriting quality and speed. *Human*

Movement Science, 22, 549-566.

16. Kambas, Aggeloussis, Proviadaki, Mavromatis & Taxildaris, (2004). Control of the internal structure and consistency of the bundle (integrated form) in preschoolers and elementary first age in Greece. Inquiries in Physical Education and Sport, *2(2),* 163-172
17. Kambas, A., Amoutzas, K., Makri, H., Gourgoulis, V., & Antoniou, P. (2002). The effect of psychomotor education emphasizing in time and space, on the development of graphomotor skills in preschoolers. *Exercise and Society, 32,* 49-57.
18. Kambas, A., Fatouros, Y., Christoforidis, C., Venetsanou, F., Papageorgiou, P., Giannakidou, D., & Aggeloussis, N. (2010) The effects of Psychomotor Intervention, on Visual-Motor Control as a Graphomotor aspect in preschool age. *European Psychomotricity Journal*, 3(1), 54-61.
19. Kouli, O., Avloniti, A., Venetsanou, F., Giannakidou, D., Gazi, S., & Kambas, A. (2010). The effect of a psychomotor training program on the motor proficiency of preschool children in
20. a multicultural environment. *European Psychomotricity Journal, 3(1),* 31-36.
21. Kouretzis, L. (1987). The game as a tool of education, learning and creative expression of preschool children and first grade of elementary school. Suggestion: Congress SELDE Athens.
22. Kouretzis, L. (2008). The Theatrical Play and dimensions. The Theatrical Play the MELINA program. Action Plans (project). Athens: Ed. Traveler.
23. Manross, M. (2000). Learning to throw in physical education class: Part 3. *Teaching Elementary Physical Education, 11(3),* 26-29.
24. Molenaar – Klumpe, M. (2002). *Non- verbal learning disabilities: Characteristics, diagnosis and treatment within an educational setting.* Philadelphia: Jessica Kingsley Publishers.
25. Norusis, M. J. (1993). *SPSS for Windows. Base system user's guide. Release 6.0.* Chicago: Marketing Department, SPSS Inc.
26. Paraskevopoulos, I. & Paraskevopoulou, P. (2011). Athena test. Diagnosis of Learning Disabilities. Examiner Guide: General Manual. Athens: Ed. Athena test.
27. Pascual- Leone, J. & Irwin, R. (1994). Noncognitive factors in high- road/ Low- road learning: I. Models of abstraction in adulthood. *Journal of Adult Development, 1,* 73- 89.
28. Pavlidou, E. (2001). Rhythmic as an Educational Tool in Early Childhood: A Combined Program of Kinetic and Rhythmic Education. Proceedings of the 3rd Panhellenic Conference of OMEP. Athens: Greek Letters.
29. Spanaki, E. (2008). Effect of an intervention psychomotor program on motor performance of primary school age children. Unpublished thesis. University, Athens.
30. Spanaki I, Skordilis E, Venetsanou F. (2010). The Effect of a Psychomotor Program on the Motor Proficiency of Early Elementary School Children. *Inquiries in Sport & Physical Education, 8(2):*132-141.

31. Tsimpidaki et al. (2013). Theatrical play for children with special educational needs. Recording a program at daycare center. Retrieved on 17 December 2013 from http://www.specialeducation.gr/files/8eatriko%20paixnidi_amea.doc.

32. Triga, E. D. (2005). Speech-language problems. Case study. Program Manager: C. Drakos. University of Athens.

33. Triga, E.D. (2010). The diagnosis of learning difficulties in blind children. Customizing ATHENS Test to Braille. Proceedings of the Second Panhellenic Special Education Conference, 15- 18 April, Athens.

34. Trouli, K. (2008). The psychomotor education in early childhood: an experimental study. 1st Symposium Greek Scientific Society Psychomotor. Retrieved in 25 March 2015 from www.phyed.duth.gr/files/congress/2008/Spa_abstracts.pdf

35. Tsapakidou, A, Zachopoulou, E., & Zografou, M. (2001). Early young children's behavior during music and movement program. *Journal of Human Movement Studies, 41*, 333- 345.

36. Zimmer, R. (2007). Motor education Manual. From theory to practice. Athens: Athlotypo.

37. Zimmer, R., Christoforidis, C., Xanthi, P., Aggeloussis, N., & Kambas, A. (2008). The effects of a psychomotor training program on motor proficiency of Greek preschoolers. *European Psychomotricity Journal, 1(2),* 3-9.

38. Venetsanou, F., Kambas, A., Sagioti, E., & Giannakidou, D. (2009). Effect of an exercise program focusing coordination on preschooler's motor proficiency. *European Journal of Psychomotricity, 2(1),* 46 -55.

39. Wilson, B. N., Kaplan, B. J., Crawford, S. G., & Dewey, D. (2000). Interrater reliability of the Bruininks-Oseretsky Test of Motor Proficiency – Long Form. *Adapted Physical Activity Quarterly, 17,* 95-110.