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The Development of Movement Synthesis Ability Through the Teaching of Creative Movement and Improvisation

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ABSTRACT *The purpose of the present study was to examine whether the teaching of creative movement and improvisation can influence the development of movement synthesis ability. Movement synthesis ability refers to the production of a movement composition. Twenty-five female freshmen, physical education students, participated in the study. They created their own series of movements improvising within a frame of fundamental movements. Their movement synthesis ability was measured on two occasions, before and after the experimental treatment. The experimental group received 10 lessons of creative movement and improvisation, while the control group did not receive any lessons of this kind. The movement syntheses of the subjects were evaluated by a 10-items scale. The statistical analysis of the data showed that three variables of synthesis ability were improved, namely, turns, changes of levels, and changes in speed and intensity, indicating that the teaching of creative movement and improvisation in the present study had a positive impact on the development of these variables.*

KEY WORDS: *Creative movement, improvisation, movement composition, synthesis ability, teaching methods.*

Introduction

Creativity is a personality factor, fundamental for the development of the self. The phenomenon of creativity is a multifaceted one, which activates all levels of self: the subpersonal (biological) level, the personal (psychological) level, the extrapersonal (cognitive) level, and the multipersonal (sociological) level (Gardner, 1989). Research indicated that creativity is closely related to intelligence, to motives, to cognition, to decision-making, and to problem-solving (Isaksen & Parnes, 1985; Mayer, 1989; Sternberg, 1989; Taylor, 1989; Plunkett, 1990; Yong, 1994).

Creativity is very important to education and is considered a useful property of any individual. Indirect teaching methods, which are characterized by experimentation, exploration and discovery, decision-making and problem solving, seem to be applicable for the development of creativity. In physical education, the indirect and pupil-centered teaching methods seem to promote mostly psychological aspects of the personality (Martinek, Zaichkowsky, & Cheffers, 1977; Emmanouel, Zervas, & Vagenas, 1992; Theodorakou & Zervas, 2003). According to Maslow (1973), non-verbal education is very important for the development of creativity. Children also have an innate prepossession of artistic activities and are usually eager to express themselves with music, painting and dance. Expression is a basic

creativity factor, while movement is viewed as a medium for artistic expression (Cerny, 1986). The role of expressive arts is also stressed in movement and creative therapies for children with disabilities (Freeman, 2000). In addition, workshops for family attunement through creative arts therapy are focusing on non-verbal communications (Caldwell, 2000). In creative movement, students use their bodies for expression and communication. They train movement improvisation within broad structures and certain frameworks. The fundamental movement categories (transferring body weight, curling and stretching, balancing, turn and twist, flight), as well as the elements of movement (space, time, weight, and flow) are used as a basis for the synthesis of movements (Laban, 1975), which the students produce through improvisation.

Maslow (1962) regarded creativity as constructive and synthetic. Contemporary researchers stress the constructive and developmental aspects of creativity, and examine the nature of creative processes in development and the developmental nature of creative processes (Sawyer, Moran, John-Steiner, Sternberg, Feldman, Csikszentmihalyi, & Nakamura, 2003). Creativity and development are basic concerns in educational theory. The constructivist approach, according to which students construct their own knowledge, is fundamental to educational theory. Constructivist teaching is improvisational, since it occurs when students can co-construct their own knowledge, and are not strictly directed by the teacher.

Research views creative teaching as an improvisational method. According to Sawyer (2004a, 2004b), creative teaching is an improvisational performance. The teacher works together with the students in a creative, interactional, and responsible way. There is autonomy as well as cooperation among students. The students collaboratively construct their knowledge and create their ideas. The development of creativity does not occur in a vacuum. There are broad structures that guide the creative process. As Sawyer (2004b) pointed out, even games performed by improvisational groups have loose rules and frameworks. Creative teaching is a disciplined improvisation, occurring within frameworks and structures (Sawyer, 2004a). Skilled teachers lead a creative lesson balancing between structure and improvisation.

Movement synthesis ability, which is the subject matter of this study, refers to the production of choreography using a music piece and through improvisation. Choreography is the process of building a movement composition, the set arrangement of dance steps and movements. It is the way to design and shape movements into a dance (Milton, 1997). Improvisation is an extemporal performance without any prior preparation. Subjects create their own series of movements just by improvising. The present study examined whether the teaching of creative movement and improvisation can improve the movement synthesis ability of the subjects. The basic hypothesis of the study was that the teaching of creative movement and improvisation can have a positive impact on the development of movement composition.

Methodology

Twenty-five female freshmen, physical education students, participated in the experimental procedure. The subjects had no former experience in any kind of experiment on the subject matter of this study or a relevant one. Students were

divided into two groups, the experimental and the control group. The experimental design included pre-test measurement, experimental treatment, and post-test measurement. Video camera was used for the recording of the movement series of the subjects.

In pre- and post-test, both groups improvised using the same piece of music lasting one minute. Each participant was alone in the gymnastics yard, when improvising. The researcher was also present for the purpose of video-recording the participant's movements. The students in the experimental group practiced creative movement and improvisation with music, while the control group had no practice of this kind. The experimental group received 10 30-minutes sessions of practicing. Selected music pieces were used in pre- and post-test, as well as in the experimental treatment. The same piece of music was used in pre- and post-test, different than the pieces used in the 10 practicing sessions. Firstly, the participants in the experimental group practiced improvisation on the basis of the fundamental movement categories, such as, transferring body weight, curling and stretching, balancing, turn and twist, flight (Laban, 1975). Then, they created their movement compositions, which should include various ways of locomotion (walking, running, dancing, rolling etc.), curling and stretching movements, waves, turning, balancing, flying, use of different levels and directions, changes in speed and intensity, flow and continuity, rhythm, expression, variety of movements, use of all space, presentation of the movement series as a unity. After the ten sessions of creative movement and improvisation teaching, the subjects were also videotaped, while improvising under the same circumstances as in pre-test.

Evaluation of the Synthesis

The syntheses of the whole sample in pre- and post-test were evaluated with the use of a 10-items scale. The scale included the following ten synthesis variables (V): 1) Locomotion in space, changes in directions (V1). 2) Curling and stretching, waves (V2). 3) Turns (V3). 4) Balancing (V4). 5) Flights (V5). 6) Changes of levels (V6). 7) Changes in speed and intensity (V7). 8) Flow (V8). 9) Rhythm (V9). 10) Variety of movements (V10). Each item of the scale had the follow three levels of performance: Nothing/Little (1), Some (2), Full (3).

The movement syntheses of the subjects were evaluated by three judges, movement experts, through indirect observation of the video-tapes. Each judge individually graded the performance of each participant prior and after the treatment. Prior to the evaluation, the judges had practiced on the criteria of the synthesis and reached unanimous conclusions regarding the evaluation criteria.

Results

A t-test for independent samples was conducted in the first measurement between the 10 variables of synthesis ability. The analysis of the results showed significant difference between experimental and control group in pre-test, therefore a one-way ANCOVA was required for the adaptation of the first measurement according to ANCOVA model. The analysis of covariance for the main result in the second measurement for both groups revealed statistically significant differences in some variables.

$PT_{(Exp+Cont)}V1$, ($F_{1, 22} = 23{,}09$, $p. < .001$)
$PT_{(Exp+Cont)}V\ 2$, ($F_{1, 22} = 4{,}69$, $p < .05$)
$PT_{(Exp+Cont)}V3$, ($F_{1, 22} = 5{,}76$, $p < .03$)
$PT_{(Exp+Cont)}V5$, ($F_{1, 22} = 4{,}54$, $p < .05$)
$PT_{(Exp+Cont)}V9$, ($F_{1, 22} = 5{,}15$, $p < .05$)
$PT_{(Exp+Cont)}TL$, ($F_{1, 22} = 14{,}17$, $p < .002$)

And no statistically significant differences in the follow variables:

$PT_{(Exp+Cont)}$ V 4, ($F_{1, 22} = 0{,}41$, $p > .05$)
$PT_{(Exp+Cont)}$ V 6, ($F_{1, 22} = 2{,}92$, $p > .05$)
$PT_{(Exp+Cont)}$ V 7, ($F_{1, 22} = 3{,}47$, $p > .05$)
$PT_{(Exp+Cont)}$ V 8, ($F_{1, 22} = 2{,}28$, $p > .05$)
$PT_{(Exp+Cont)}$ V 10, ($F_{1, 22} = 1{,}35$, $p > .05$)

(PT= Post-test), (TL=total) where V 1 , V 2, V 3, etc., is the respective variable

The means (M) and the standard deviations (SD) of the values of the dependent variables of synthesis ability are shown in Table 1 for the first measurement, and in Table 2 for the second measurement. The differences in means (M) and standard deviations (SD) between the first and the second measurement are shown in Table 3. The summary of the results is shown in Table 4.

The means of main result for experimental and control group in the first and second measurement are shown in Figure 1, while the means of the dependent variables of synthesis ability in the first and second measurement, and the differences between them are shown in Figure 2.

Table 1
Descriptive Statistics of the Dependent Variables of Synthesis Ability in the First Measurement

Group		TV1	TV2	TV3	TV4	TV5	TV6	TV7	TV8	TV9	TV10	TVT
Experimental (N = 12)												
	M	3,50	3,58	5,42	3,00	3,67	3,25	3,17	3,50	3,67	3,17	35,92
	SD	1,00	1,08	1,83	,00	1,56	,87	,39	,90	,89	,58	5,93
Control (N = 13)												
	M	4,31	3,38	5,46	4,15	6,31	4,00	3,92	4,92	4,54	3,31	44,31
	SD	1,11	,65	2,70	1,86	2,36	1,08	1,12	1,38	1,45	,63	8,31
Both groups (N=25)												
	M	3,92	3,48	5,44	3,60	5,04	3,64	3,56	4,24	4,12	3,24	40,28
	SD	1,12	,87	2,27	1,44	2,39	1,04	,92	1,36	1,27	,60	8,30

TV1= pre-test variable 1, TV2= pre-test variable 2, et c.

Table 2
Descriptive Statistics of the Dependent Variables of Synthesis Ability in the Second Measurement

Group		PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PVT
Exper. (N=12)	M	5,92	4,67	7,50	4,58	7,42	4,33	4,08	5,25	5,08	4,25	53,17
	SD	1,44	1,23	1,24	1,73	1,00	1,15	,51	1,42	1,38	,62	5,72
Control (N=13)	M	3,77	3,77	6,15	4,15	6,77	4,00	3,92	4,23	4,08	3,85	44,69
	SD	,83	,73	2,03	1,41	2,17	1,41	,76	1,09	1,26	1,21	8,43
Total (N=25)	M	4,80	4,20	6,80	4,36	7,08	4,16	4,00	4,72	4,56	4,04	48,76
	SD	1,58	1,08	1,80	1,55	1,71	1,28	,65	1,34	1,39	,98	8,32

PV1= post-test variable 1, PV2= post-test variable 2, et c.

Table 3
Differences in Means (M) and Standard Deviations (SD) between First and Second Measurement

Group		P-T V1	P-T V2	P-T V3	P-T V4	P-T V5	P-T V6	P-T V7	P-T V8	P-T V9	P-T V10	P-T TOTAL
Exper. (N = 12)	M	2,42	1,08	2,08	1,58	3,75	1,08	,92	1,75	1,42	1,08	17,25
	SD	1,73	1,68	1,58	1,73	1,60	1,08	,51	1,91	1,56	,90	8,79
Control (N = 13)	M	-,54	,38	,69	,00	,46	2,78	,00	-,69	-,46	,54	,38
	SD	,88	,87	2,14	2,31	2,29	1,22	1,22	1,65	1,51	1,13	6,97
Total (N=25)	M	,88	,72	1,36	,76	2,04	,52	,52	,48	,44	,80	8,48
	SD	2,01	1,34	2,02	2,16	2,57	1,26	1,26	2,14	1,78	1,04	11,56

P-T V1= post-test – pre-test variable 1, P-T V2= post-test – pre-test variable 2, et c.

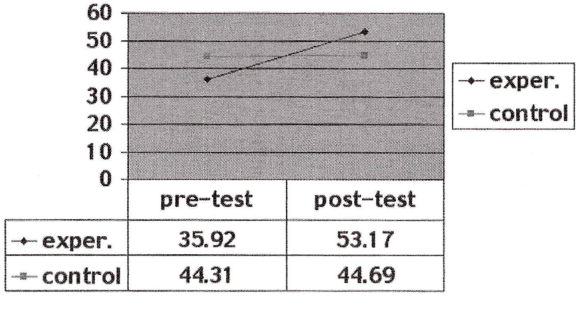

Figure 1. Means of Main Results of Synthesis Ability for Experimental and Control Group in Pre-and Post-Test.

Table 4
Summary of the Statistical Results

V100-6Y7LN-B90U8-908RV					
Source of Var.	SS	df	Ms	F	P
Covariate (V1)	,387	1	,387	,293	,594 N.S
Main effect (group)	30,527	1	30,527	23,090	,000*
Residual error	29,086	22	1,322		
V2					
Covariate (V2)	,140	1	,140	,134	,717 N.S
Main effect (group)	4,898	1	4,898	4,693	,041*
Residual error	22,961	22	1,044		
V3					
Covariate (V3)	21,946	1	21,946	10,868	,003*
Main effect (group)	11,628	1	11,628	5,758	,025*
Residual error	44,426	22	2,019		
V4					
Covariate (V4)	,115	1	,115	,045	,834 N.S
Main effect (group)	1,047	1	1,047	,407	,530 N.S
Residual error	56,597	22	2,573		
V5					
Covariate (V5)	4,178	1	4,178	1,689	,207 N.S
Main effect (group)	11,243	1	11,243	4,545	,044*
Residual error	54,419	22	2,474		
V6					
Covariate (V6)	7,012	1	7,012	5,403	,030*
Main effect (group)	3,794	1	3,794	2,923	,101 N.S
Residual error	28,554	22	1,298		
V7					
Covariate (V7)	1,786	1	1,786	5,542	,028*
Main effect (group)	1,126	1	1,126	3,495	,075 N.S
Residual error	7,088	22	,322		
V8					
Covariate (V8)	2,876	1	2,876	1,738	,201 N.S
Main effect (group)	3,768	1	3,768	2,278	,145 N.S
Residual error	36,396	22	1,654		
V9					
Covariate (V9)	,483	1	,483	,287	,597 N.S
Main effect (group)	8,668	1	8,668	5,152	,033*
Residual error	37,009	22	1,682		
V10					
Covariate (V10)	,890	1	,890	,942	,342 N.S
Main effect (group)	1,278	1	1,278	1,353	,257
Residual error	20,792	22	,945		
RETOTAL					
Covariate (TOTAL)	1,741	1	1,741	0,38	,847 N.S
Main effect (group)	649,893	1	649,893	14,171	,001*
Residual error	1008,926	22	45,860		

The results showed statistically significant differences between the experimental and the control group in the following dependent variables:

V3, ($F_{1,22} = 10{,}868$, $p < .05$)

V6, ($F_{1,22} = 5{,}403$, $p < .05$)

V7, ($F_{1,22} = 5{,}542$, $p < .05$)

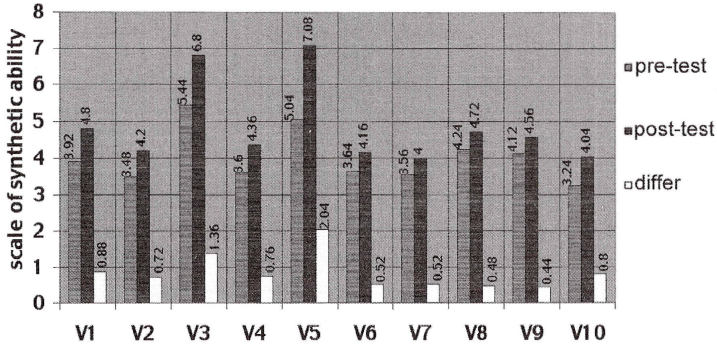

Figure 2. Means of the Dependent Variables of Synthesis Ability in Pre- and Post-Test, and the Differe nce between Them

The results, also, showed non significant differences in the following dependent variables:

V1, ($F_{1,22}$ = 0,293 , p > .05)

V2, ($F_{1,22}$ = 0,134 , p > .05)

V4, ($F_{1,22}$ = 0,045 , p > .05)

V5, ($F_{1,22}$ = 1,689 , p > .05)

V8, ($F_{1,22}$ = 1,738 , p > .05)

V9, ($F_{1,22}$ = 0,287 , p > .05)

V10,($F_{1,22}$ = 0,942 , p > .05)

V1=Locomotion in space, changes in directions, V2=Curling and stretching, waves, V3=Turns

V4=Balancing, V5=Flights, V6=Changes of levels, V7=Changes in speed and intensity., V8=Flow, V9=Rhythm, V10=Variety of movements.

Discussion

The findings of the present study showed a significant improvement ($F_{1,22}$=14,17 and p.<.002) for the whole sample, after the application of the teaching of creative movement and improvisation, in agreement with relevant literature (Maslow, 1962; Sawyer et al., 2003). It seems that the indirect teaching methods, which promote experimentation, problem solving, decision making and constructing new ideas, like the method of creative movement and improvisation used in this study, have a positive impact on the development of the components of synthesis ability. This knowledge can be useful in education, if we want to make people creative and constructive. As Maslow (1971) pointed out, if we want the world to progress and not to be static, we need individuals, who can improvise in situations they have not met before. Besides, the fact that environment is considered as a fundamental factor for the development of creativity (Torrance, 1971; Ripple, 1989) indicates that schools can play an important role towards this direction.

The comparisons between the experimental and the control group separately indicated that the students in the experimental group had significantly better per-

formance on three of the dependent variables, namely, the variables 3, 6, and 7 (referring to turns, to changes of levels and to changes in speed and intensity) than the corresponding performance of students in the control group. At the same time, the students in the experimental group did not outperform students in the control group on the other variables (1, 2, 4, 5, 8, 9, and 10). These findings indicate that the teaching of creative movement and improvisation improved synthesis ability with regard to turns, changes of level, changes in speed and intensity. A plausible explanation of these results relates to the duration of the intervrention. It seems that the practicing period was only enough for those variables to develop, while the other variables required a longer period of practice. Another alternative explanation relates to the ability of the subjects to cope with the ten variables simultaneously, considering that they were young and inexperienced students with no former practice or experience of showing their own movement series, in a gymnasium, while being video-filmed. In any case, the main hypothesis regarding the positive impact of creative movement and improvisation on movement synthesis ability was partially verified, since the results showed an improvement in the development of synthesis ability, in accordance to other studies (Emmanouel et al., 1992 ; Theodorakou & Zervas, 2003). The results clearly demonstrate that indirect teaching methods, as the method of creative movement, have a positive influence on the developoment of the cognitive and the psychological aspects of the personality, as the ones involved in composition procedure.

The fact that after the experimental treatment, movement synthesis ability was to some extend improved supports the conclusion that we can influence the development of movement synthesis ability through the teaching of creative movement and improvisation. Due to the small sample size, the short duration of the intervention and the large number of variables that were compared, the present results should be interpreted with caution. Thus, we propose similar studies to be conducted in future, using more practicing time, as well as larger sample. It would be interesting to examine the development of movement synthesis ability in children, with the use of variables adapted to the age of the children and the implications of children's movement synthesis ability on their academic performance.

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Scale of Evaluation of the Synthesis

Group..... Subject number.....

Variables	Little/ Nothing (1)	Some (2)	Full (3)
1. Locomotion in space/ Changes in direction/ Use of all space			
2. Curling and stretching movements/waves			
3. Turns			
4. Balancing			
5.Flights			
6. Changes of level			
7. Changes in speed and intensity			
8. Flow			
9. Rhythm			
10. Variety of movements/ presentation as unit			
Total			