The effect of using cross trainings on developing some coordination abilities and improving the performance level of modern creative dance

[*]**D/ Maha Mohamed Azab Elzeiny**

Abstract:

This research aims to design a program using cross trainings and to know its effect on developing some coordination abilities and improving the technical performance level of modern dance. The female researcher used the experimental method on a sample of (30) female students of the 4th year in Physical Education Faculty. Some of the research tools are the coordination abilities tests and the evaluation of the technical performance level of modern dance. One of the most important results of the cross trainings studied in the research that these trainings have a positive effect on developing some coordination abilities (the ability to exert the maximum effort – the static and motor balance – the ability of motor organization and direction – the ability of sensing the direction - the ability of place direction and changing the direction) and on improving the performance level of modern dance.

Key words:

Research Problem:

The researcher noticed during her work as a teacher of kinetic expression in general and modern creative dance in particular in Physical Education Faculty that there is a considerable decrease in the performance level of the female students in the skills of the kinetic phrase designated for them. The researcher attributed this to the decrease of coordination abilities level related to raising the performance level of some skills the students have which led to their being unable to perform in smooth sequential way especially in performing the complex motor skills that require a coordination between the moves performance of the head, the arms and the legs, which affected the smooth motor performance. Also, the lack of economizing the exerted effort due to their use of the muscle groups which are not desired in the performance. This reflected on the students' performance level of motor skills designated for them and consequently on technical and performance form of the

[*] Teacher of training, gymnastic and kinetic expression department, Physical Education Faculty, Menoufia University.

kinetic phrase as a whole. By viewing many modern training methods and techniques, the researcher saw that improving the performance level of the students can be done by developing the coordination abilities which have a clear role in raising the performance level of some modern dance skills, through using a new kind of training which is the cross training by making a suitable training program based on scientific bases and contains athletic activities and diverse training techniques of the cross trainings.

The researcher also sees that through using this program, the students' coordination abilities can be improved to be the basic pillar in order to raise their skill performance level and also creating the kinetic phrase of modern dance. As far as the researcher knows and through what she could review of theoretical readings, previous studies and the Arabic and foreign scientific references specialized in this field, she noticed that research topic had not been handled by anyone in the kinetic expression field "modern dance", which urged the researcher to make a program of the cross trainings to develop some coordination abilities in order to improve the performance level of modern dance.

Research aim:

This research aims to design a program by using the cross trainings and to recognize its effect on:

1- Developing some coordination abilities which are (the ability to exert maximum effort – the static and motor balance – the ability of motor organization and direction – the ability of sensing direction – the ability of place direction and changing the direction) of the sample studied in the research.

2- Improving the technical performance level of modern dance of the sample studied in the research.

Research Hypotheses:

1- There are statistically significant differences between the after and before measurements in the coordination abilities and the technical performance level of modern dance of the experimental group in favor of the after measurement.

2- There are statistically significant differences between the before & after measurements in the coordination abilities and the technical performance level of modern dance of the control group in favor of the after measurement.

3- There are statistically significant differences between the two after measurements of both groups; the experimental and the control in the coordination abilities and the

technical performance level of modern dance in favor of the experimental group.

Research Method:

The experimental method was used on two groups; the experimental and the control groups.

Research Society & Sample:

The research society was chosen deliberately from the 4th year students of Physical Education Faculty, Menoufia University of the scholar year 2012/2013, they were (40) female students. The researcher took a pilot sample of (10) female students to make the scientific interactions of the used tests, thus, the research basic sample became (30) female students and they were divided randomly into two groups; experimental and control each consists of (15) female students.

Adjusting Research Variables:

The researcher performed the coherence of research society of (40) students to make sure that it is under the equinoctial curve in the following variables : (age – height – weight), and some coordination abilities studied in the research, and the technical performance level of modern dance, as shown in table (2).

Table (1)
The coherence of research society in all the selected variables studied in the research N= 40

Variables		Measurement unit	Arithmetic means	Standard deviation	medium	Coefficient of torsion
growth	age	year	21.46	1.312	21.50	-0.092
	height	cm	166.75	2.486	167.00	-0.302
	weight	kg	67.25	2.237	67.00	0.335
Coordination abilities	The ability to exert maxi. effort	meter	8.59	0.203	8.60	-0.148
	Ability of static balance	second	8.75	0.922	7.80	-0.163
	Ability of motor balance	second	18.89	1.060	19.10	-0.594
	The ability of motor organization and direction.	Number	3.63	0.083	3.60	1.084
	The ability of sensing direction	degree	5.26	0.824	5.00	0.947

Follow Table (1)
The coherence of research society in all the selected variables studied in the research N= 40

Variables		Measurement unit	Arithmetic means	Standard deviation	medium	Coefficient of torsion
	The ability of place direction and changing direction	degree	2.55	0.639	2.50	0.235
The technical performance level of modern dance	Constriction and fall	degree	1.34	0.637	1.40	-0.283
	Moves of rolling, stretching and bounce	degree	1.37	0.806	1.50	-0.484
	Body push and balance	degree	1.52	0.794	1.60	-0.302
	Total of phrase moves	degree	4.23	2.237	4.50	-0.362

Table (1) shows that all the torsion coefficient values of growth variables and some coordination abilities and technical performance level of modern dance are between (-0.092 : 1.084) which means that they are between (±3) which indicates the equinoctial distribution of research sample personnel in these variables.

Tools of Data Gathering:

- Equipped training hall – Swedish bench – step box – borders – colored chalks – eye band – cameras – a cassette to hear music.
- The coordination abilities tests of technical performance level of modern dance which the experts agreed on, as follows:

1- The ability to exert maximum effort:

- Test of throwing the ball using both arms, the measurement unit is the meter (16).

2- Ability of Balance:

- Test of standing on the instep "static balance", measurement unit is the second (16).
- Test of jumping with both feet inside the hexagon, measurement unit is the second (32).

3- The ability of motor organization and direction:

- Test of jumping the robe, measurement unit is the number (16).

4- The ability of sensing the direction:

- Test of walking in the passage, measurement unit is the degree (32).

5- The ability of place direction and changing the direction:

- Test of changing the direction of the body, measurement unit is the degree (32).

- **The evaluation of technical performance level of modern dance:**

A motor phrase of modern dance was designed; its duration was (3 min.) to measure the skill performance level of the experimental and the control group. The motor phrase included many sudden, descending and smooth continuous movements. These movements consist of modern dance skills such as constriction, falling, rolling, stretching, rebound, body push and balance. The motor phrase was performed accompanied with music which has been chosen according to the nature of the motor phrase in diverse performance speed. The performance level of the motor phrase in modern dance was evaluated before applying the suggested program. Then after finishing the total period of applying the program by a committee of (3) female judges who are members of the teaching staff of kinetic expression and who suggested to define (5) degrees of constriction and falling movements – (5) degrees of rolling, stretching and rebound movements – (5) degrees of body push and balance, thus, the total is (15) degrees of all motor phrase movements.

- **The suggested program using cross trainings.**

Procedures of designing the suggested training program using (cross trainings):

The researcher designed (2) forms to know the experts' opinions in the following:

1- Determining the suitable athletic activities and training techniques of the cross trainings program.

2- Determining the total period of the program, the number of weekly training units, the duration of the daily training unit and the severity of the used load.

Table (2)
The percentage rates of experts' opinions

about determining the content of the training program

Suggested program content	Experts' opinion	Percentage rates
1- Suitable athletic activities and training techniques	Diverse jumps – karate trainings – trainings from the athletic walk.	90%
2- Program total period	8 weeks	90%
3- Number of training units per week	3 training units	100%
4- warming period during the daily unit from the program start to its end	(5) minutes	90%
5- duration of basic training period from program start to its end	(35) min. – (80) min.	100%
6- duration of calming period from program start to its end.	(5) minutes	100%
7-severty of training load.	Medium load (60 – 69%) from the maximum rate of the heart speed of performance timing.	100%

Table (2) shows the percentage rates of the experts' opinions about determining the suggested program content of cross trainings.

Evaluation of the Suggested Program:

The researcher displayed the suggested program in its primary form on the experts and after she made the adjustments which they recommended it was displayed on them in its final form once more until they admitted the validity and suitability of suggested training program content using the cross trainings for application and to achieve the aim that was put for.

Components of the daily training unit:

The total period of the training program was defined (8) weeks, contains (24)

training units, as (3) training units weekly where the daily training unit included three basic periods as follows:

A- Warming period:

Preparing different parts of the body to perform the main part of the training unit, and includes a group of trainings for each part of the body (the neck – the arms – the trunk – the legs) in order to prepare the muscles for work and consequently avoid the occurrence of the injury. The designated time for this part is (5) min. from the total time designated for the daily training unit during the program application period.

B- Basic Training Period:

Achieving the main aim of the program, the time designated for this part in the beginning of the program (35) min. and increased gradually each two weeks (15) min. as (5) min. for each practiced activity inside the daily training dose until the total time of this period reached (80) min. in the end of the total period of the program; this part includes the following activities:

- **Diverse leaps:** a group of different leaps such as jump, jumping in place, jumping on the step box, hop and jumping to over barriers beside the upper limbs trainings and the lower limbs of the body and they are performed accompanied with music. These diverse leaps are performed by time duration of (10) min. in the 1st and 2nd weeks from the start of the program then it increases gradually (5) min. each two weeks to become (25) min. in the end of the program.
- **Athletic Walk trainings**: legs & arms movements, coordination and connecting them as they are performed to the front, the back, the side and in all directions and angles of the hall designated for training accompanied with music. The athletic walk trainings are performed for a time of (15) min. in the 1st and 2nd weeks from the start of the program and increases gradually (5) min. each two weeks to become (30) min. in the end of the total period of the program.
- **The in-between breaks periods**: the basic training period included break periods of (30) seconds between each activity in the 1st and 2nd weeks of the program then, the break periods increased each two

weeks another (30) seconds until the break period between each activity reached (120) seconds in the end of the total period of the training program. The main aim from the in-between break periods is the psychological and physical preparation of the students and to restore the energy of different body systems in order to be ready for the next activity beside to benefit from this period in (changing the music – preparing to transfer from one activity to another).

- Calming period: the time designated for calming period is (5) min. in the end of each daily training unit in order to organize the breathe operation which lead to regular heart rate and that different body systems return to its normal state.
- In the second week, the variable of (the ability of sensing the direction, the muscular-nervous coordination) is developed by performing its trainings.
- In the third week, the variable of (static and motor balance, the motor-sense perception) is developed by performing its trainings.
- This is done through the daily weekly units all along the application of the suggested program.

Severity of the used load in the suggested program using the cross trainings

- The severity of the used load during the suggested program using the cross trainings was between 60 – 69% from the maximum severity the student perform with pulse rate (148 : 159 pulse/min.) in (athletic walk trainings), as for (karate trainings, diverse leaps) the severity load was via performance timing speed.

The pulse rate was defined and used to immediately recognize the load suitability for the level of the student training state, and the in-between break period during the training, and also the suitable time to increase the training unit.

The before measurement:

The before measurement of the two research groups; the experimental and the control was performed in some coordination abilities and the technical performance level of modern dance in the period from 25/2 to 27/2/2013.

The Application of the Basic Study:

The suggested training program was applied on the

experimental group in the period from 2/3 to 25/4/2013. The suggested training program included (8) training units and was applied on (8) weeks as (3) training units per week, thus, the program included (24) training units. Then, the suggested program was applied on the experimental group. The followed program in the faculty was applied on the control group for three days in the week. The researcher took into consideration that the time which the control group took equals the time which the experimental group took.

The After Measurement:

The after measurement was performed on the experimental and the control groups in the period from Saturday 27/4 to Monday 29/4/2013.

Display & Discussion of the Results

Table (3)

The statistically significant differences between the two averages of the before & after measurements of the experimental group in some coordination abilities and the technical performance level of modern dance studied in the research N= 15

Variables		Measurement unit	Before measurement		After measurement		"T" value
			M	$D^1\pm$	M	$D^2\pm$	
Coordination abilities	The ability to exert maxi. effort	meter	8.63	0.232	10.88	0.722	*11.10
	Ability of static balance	second	8.80	1.111	12.47	1.161	*8.545
	Ability of motor balance	second	18.93	1.170	15.67	1.081	*7.657
	The ability of motor organization and direction.	Number	3.65	0.074	4.73	0.294	*13.33
	The ability of sensing direction	degree	5.20	0.676	7.40	0.547	*9.466

Follow Table (3)

The statistically significant differences between the two averages of the before & after measurements of the experimental group in some coordination abilities and the technical performance level of modern dance studied in the research N= 15

Variables		Measurement unit	Before measurement		After measurement		"T" value
			M	$D^1\pm$	M	$D^2\pm$	
	The ability of place direction and changing direction	degree	2.53	0.640	4.20	0.775	*6.217
The modern dance	Constriction and fall	degree	1.35	0.615	3.29	0.331	*10.393
	Moves of rolling, stretching and bounce	degree	1.42	0.823	3.46	0.418	*8.269
	Body push and balance	degree	1.52	0.784	3.65	0.466	*8.738
	Total of phrase moves	degree	4.29	2.236	10.40	1.216	*8.982

Table (3) shows that there are statistically significant differences between the two averages of the before and after measurements in some coordination abilities and the technical performance level of modern dance studied in the research in favor of the after measurement. The researcher attributes this to the nature of the suggested program training using cross trainings which contains a diverse group of trainings such as (diverse leaps – karate trainings – trainings from the athletic walk) which are performed using support bar or a colleague or tools such as (barriers – cones – step box) either from static or motor using one part of the body or different parts. In addition to a group of physical trainings which lead to developing the coordination between arms, legs and the head and serves the female students during their performance of the modern dance skills and improves the performance level. The researcher also attributes the improvement of the coordination abilities (studied in the research) and related to the improvement of the

performance level of the free phrase in modern dance of the experimental group to the existence of a positive correlation between the coordination abilities from one side and the performance level on the other side, which confirms that the improvement in coordination abilities is necessarily followed by an improvement in the performance level.

These results agree with the study results of Raczek (2002) (25) which indicate that the coordination abilities have great importance in training as the coordination abilities level is reflected directly on the skill performance level. Meaning that, the more the excellence degree of the coordination abilities increase, the more the performance was excellent; therefore, the motor performance has a positive correlation with the coordination abilities.

The researcher sees that the cross trainings and what they contain of diverse trainings work to develop the dynamic balance; the part related to diverse leaps and karate trainings which work to keep the body balance and controls it during performing the complex movements and also to keep the body weight and the sense of place and dimensions during the performance. Mohamed Sobhy Hassanin (1995) (8) indicates that the dynamic balance of great importance in keeping the body balance during the individual's performance of any athletic movement either this was walking, or running and it also helps in keeping the body posture of the person without losing his balance.

The cross trainings program also included diverse trainings such as karate trainings which contain many kicks and punches that are performed in all directions and also the athletic walk trainings that are performed in all directions and angles using legs, arms and the head in the same time in order to develop the variable of motor sense perception represented in (the ability to exert the maximum effort, the static and motor balance, the ability of motor organization and direction, the ability of sensing the direction, the ability of place direction and changing the direction) as these variables have great importance in improving the motor performance because its

gathers in it many kinds of senses such as the motor – muscular sense and also the visual sense and the time and balance sense. All these senses participate together when performing a certain skill in order to form a motor sense of the skill. Ahmed Khater and Ali Elbek (2001) (1) confirms that, as when the motor sense perception is correct, this means that the motor performance will be of high degree of accuracy. The athletic that recognizes the skill correctly, become more capable of performing it correctly.

The researcher sees that the ability of place direction and changing the direction of great importance in developing the skills of modern dance, and also improving the performance level of the motor phrase for what it requires of the necessity of having the elements that affect the modern dance which are concentration, the level, the range, the space and the directions; these important elements require a great deal of motor sense during the performance where the female student can well recognize these elements during the continuous performance of the kinetic phrase which achieve high performance level of the free phrase in modern dance. This agrees with what Essam Eldin Abdel Khalek (2005) (7) indicated as he mentioned that the improvement in the place direction and changing the direction have relation with the rest of the other elements and lead to the improvement of skill performance level.

The researcher attributes the considerable positive improvement in the after measurement of the experimental group to the effect of the used cross trainings program and what it includes of diverse and different activities and purposeful exercises in addition to following the scientific method when planning this program. The cross trainings program contains many exercises and different activities such as (trainings from karate – diverse leaps – trainings from athletic walk) the main aim from all these diverse trainings is to develop the coordination abilities (studied in the research) and raising the performance level. As the coordination abilities are the

harmony between the physical & motor abilities, they also clarify the person's level of setting and directing many motor skills in place, time and dynamic harmony. Coordination abilities means the person's ability to organize the mutual effect between the skill & physical abilities to get the ideal model of the motor performance according to the required aim depending on the safety and harmony of body internal systems. This agrees with Rebecca & Christine (2002) (26) as they indicated that the coordination abilities trainings lead to an improvement in technical & skill performance level of many skill activities specially the motor expression.

The study of Madella (1999) (24), Wojchech Strosciak (2006) (27), Sherin Ahmed Youssef (2001) (4), Nevin Hussein Mahmoud (2004) (11), Manal Ahmed Amin (2005) (10), Mohamed Yehia Abdu (2008) (9), Bassmat Mohamed Ali (2), and Abdel Hameed Ali Emara (2010) (6) that the coordination abilities clearly contributed in the quick excellence and gaining motor skills which clearly reflected on the skill performance level in different athletic activities.

Table (4)

The statistical differences significance between the two averages of before and after measurements of the control groups in some coordination abilities and the technical performance level of modern dance studied in the research N = 15

Variables		Measurement unit	Before measurement		After measurement		"T" value
			M	D^1 ±	M	D^2 ±	
Coordination abilities	The ability to exert maxi. effort	meter	8.55	0.223	9.15	0.315	*5.817
	Ability of static balance	second	8.69	1.058	9.81	0.479	*3.608
	Ability of motor balance	second	18.81	1.254	17.64	1.181	*2.541

Follow Table (4)

The statistical differences significance between the two averages of before and after measurements of the control groups in some coordination abilities and the technical performance level of modern dance studied in the research N = 15

Variables		Measurement unit	Before measurement		After measurement		"T" value
			M	D^1 ±	M	D^2 ±	
	The ability of motor organization and direction.	Number	3.62	0.086	4.21	0.264	*7.951
	The ability of sensing direction	degree	5.30	0.795	6.20	0.676	*3.227
	The ability of place direction and changing direction	degree	2.47	0.634	3.30	0.857	*2.913
The modern dance	Constriction and fall	degree	1.38	0.624	2.25	0.469	*4.170
	Moves of rolling, stretching and bounce	degree	1.39	0.812	2.40	0.483	*3.100
	Body push and balance	degree	1.56	0.798	2.55	0.528	*3.871
	Total of phrase moves	degree	4.33	2.257	7.20	1.373	*4.065

(T) table value at significance level 0.05 = 2.145 * significance level

Table (4) shows that there statistically significant differences between the two averages of the before & after measurements of the control group in some coordination abilities and the technical performance level of modern dance studied in the research and in favor of the after measurement. The researcher attributes this result to the effect of the traditional program followed in the faculty which its duration equals that of the suggested program; it was (3) times per week for (8) weeks and the

followed program contains (5) minutes for warming-up, also the duration of the basic training period used in the cross training of the experimental group is equal to the period of the control group, the calming period is (5) minutes. This followed program had a positive effect on developing some coordination abilities but less than that of the experimental group. The researcher sees that may be due to that the followed program in the faculty does not contain the sufficient amount of skills, movements and trainings which helps to develop these coordination abilities side by side with the skill aspect; and also because the followed program does not contain trainings related to developing the coordination abilities and the designated skills and improving the performance level. The lack of ideal use of different levels and directions during the motor performance and it pays attention to the skill aspect only which is related to teaching the students the designated skills which decreased the opportunity of development and improvement of the coordination abilities of the students and consequently, affected the performance level.

Table (5)

The statistical differences significance between the two after measurements of the experimental & control groups in some coordination abilities and the technical performance level of modern dance studied in the research N1 = N2 = 15

Variables		Measurement unit	Before measurement		After measurement		"T" value
			M	$D^1\pm$	M	$D^2\pm$	
Coordination abilities	The ability to exert maxi. effort	meter	10.88	0.722	9.15	0.315	*11.621
	Ability of static balance	second	12.47	1.161	9.15	0.479	*11.207
	Ability of motor balance	second	15.67	1.081	17.64	1.181	*6.964

Follow Table (5)

The statistical differences significance between the two after measurements of the experimental & control groups in some coordination abilities and the technical performance level of modern dance studied in the research N1 = N2 = 15

Variables		Measurement unit	Before measurement		After measurement		"T" value
			M	$D^1\pm$	M	$D^2\pm$	
	The ability of motor organization and direction.	Number	4.73	0.294	4.21	0.246	*6.964
	The ability of sensing direction	degree	7.40	0.547	6.20	0.676	*7.302
	The ability of place direction and changing direction	degree	4.20	0.775	3.30	0.857	*4.122
The modern dance	Constriction and fall	degree	3.29	0.331	2.25	0.469	*9.587
	Moves of rolling, stretching and bounce	degree	3.46	0.418	2.40	0.483	*8.781
	Body push and balance	degree	3.65	0.466	2.55	0.528	*8.265
	Total of phrase moves	degree	10.40	1.216	7.20	1.373	*9.232

(T) Table value at significance level 0.05 = 2.048 * significance level

Table (5) shows that there are statistically significant differences between the two after measurements of the experimental and control groups in some coordination abilities and the technical performance level of modern dance studied in the research. The researcher attributes this result to that the used cross trainings represented in (diverse trainings from karate – diverse trainings from athletic walk – diverse leaps), as these diverse trainings were applied on the experimental group and not the control group; as the

performance nature of these trainings requires the work of more than one part of the body in the same time along with the continuous performance; as these trainings concentrate on the work of a big group of muscles such as arms, legs and the head muscles which work in different directions from stability or movement; this diversification in cross trainings concerning the used activities, the performance nature and the different speed in performance and the movement nature with the musical rhythm which helps in the continuous performance without the early feeling of fatigue and boredom, all of this effectively contribute in developing coordination abilities and improving the performance level of the experimental group of modern dance.

The researcher also sees that the cross trainings have a positive effect in developing the coordination abilities (studied in the research) and improving the skill performance level of modern dance and also improving the students' ability of motor connection during their performance of the created motor phrase and improving their ability of coordination between the movements of arms, legs and the head and their ability of performing complex skills in an easy and sequential way with economizing in the desired effort. This agrees with the study of Yasser Mohamed Othman (2005) (12), Hassan Ibrahim Abdel Hameed (2008) (3), and Sherin Ali Hassan (2010) (5) as they indicated that cross trainings work to develop coordination abilities and improve the performance level.

The researcher sees that the factors which helped in developing and improving the coordination abilities of what they contain of abilities such as (the ability to exert the maximum effort, the static and motor balance, the ability of motor organization and direction, the ability of sensing the direction, the ability of place direction and changing the direction) all these abilities were developed as a result to applying the cross trainings with what they contain of diverse activities and exercises, which had the effective impact in improving the technical performance level of modern

dance. As the coordination abilities of the basic requirements in motor expression in general and modern dance in particular, moreover, the basic work in the cross trainings depends on the coordination between different body parts such as legs, arms and the head in different directions from stability or movement, which is also considered of the important requirements that determine the skill performance level in modern dance.

This also agrees with what Juliuus Kass (2005) (23) indicated that the players' possession of coordination abilities in different athletic activities helps in shortening the time of acquiring the motor skills and excelling them, and also that coordination abilities is based directly on the level of functional and morphological efficiency of the player.

The researcher also sees that practicing the control group of the followed program in the faculty was less in degree compared to the experimental group, this is because the program followed in the faculty does not contain the sufficient amount of motor skills and trainings that help in developing these coordination abilities along with the skill aspect and also the followed program does not contain the special trainings of developing the coordination abilities related to the designated skills and improving the performance level, and the lack of the ideal use of different levels and directions during the motor performance but it only pays attention to the skill aspect related to teaching the students their designated skills which decreases the opportunity of developing and improving the coordination abilities of the students and consequently affects the performance level.

Conclusions:

1- Cross trainings studied in the research have a positive effect on developing some coordination abilities studied in the research.

2- Cross trainings studied in the research have a positive effect on improving the performance level of modern dance.

3- The program followed in the faculty has a relatively limited positive effect on developing some coordination abilities studied in the research and performance level of modern dance.

4- Using cross trainings led to the superiority of the experimental group on the control group in all selected variables studied in the research.

References:

1- Ahmed Mohamed Khater, Ali Fahmy Elbek (2001): the measurement in the athletic field, 3rd edition, Dar Elmaaref, Alexandria.

2- Bassamt Mohamed Ali (2009): the effect of a training program to develop some special coordination abilities on the performance level of Kata players in karate, the international conference to develop the scientific research, Tanta University.

3- Hassan Ibrahim Abdel Hameed (2008): the effect of using the complex training in developing the special coordination abilities and the digital level of long jump competitors, an unpublished master degree, physical education faculty for males, Zagazig University.

4- Sherin Ahmed Youssef (2001): developing some coordination abilities and its relation with the level of complex attack performance in fencing, an unpublished Ph. D. degree, physical education faculty for females, Zagazig University.

5- Sherin Ali Hassan (2010): using the cross trainings in developing the flexibility and the muscular strength of junior swimmers and its effect on the digital achievement, a Ph. D. thesis, unpublished, physical education faculty, Alexandria University.

6- Abdel Hameed Ali Emara (2010): the effect of a suggested training program to develop the coordination abilities on some complex skills in wrestling, the 13th international scientific conference, 4th volume.

7- Essam Eldin Abdel Khalek (2005): the athletic training theories and applications, 9th edition, Elmaaref Establishment, Alexandria.

8- Mohamed Sobhy Hassanin (1995): the measurement and correction in physical education, part 1, 3rd edition, Dar Elfekr Elaraby, Cairo.

9- Mohamed Yehia Abdu (2008): the effect of developing coordination abilities on improving complex skill performance level of Judo juniors and its relation with some kinematic parameters, the 4th regional conference of the international council for

health, physical education and recreation in the Middle East.

10- Manal Ahmed Amin (2005): the effect of a suggested program using computer on developing coordination abilities and skill performance level in the rhythmic technical trainings of physical education faculty students, Menia University, magazine of sport sciences, Menia University.

11- Nevin Hassanin Mahmoud Khalil (2004): the effect of a training program of coordination abilities on some technical skills of Judo female players, an unpublished master thesis, physical education faculty for females, Cairo University.

12- Yasser Mohamed Othman (2005): the effect of using a cross training in keeping the physical and skill variables of football players during the competition period, an unpublished master thesis, physical education faculty for males, Helwan University.

13- Julius Kasa (2005): Relationship of motor abilities and motor skills in sport games, the factors determining effectiveness in team games, Comenius university, Brat. Slavaa, Slovakia.

14- Madella, A., (1999): Atelica Leggera Capacita Coordinative (Track and Field and Coordination Abilities) SDS, Rivisk Bicultural. Sportive 4, (2). Nov.

15- Raczek, J., (2002): Entwicklungs- Veränderungen der motorischen Leistungs fähigkeit der Schuljugend in drei Jahrzehnten (1995-2001). Tendenzen, Ursachen und Konsequenzen. In: Sportwissenschaft (32) 2, 201-216.

16- Rebecca Valls, Christine Lidval, (2002): Modern Dance Rice Recreation Center, U.S.A.

17- Wojchech Strosciak (2006): Motor learning and the Age and the level of Coordination Dexterity in Girls, human Movement, No 1(7).