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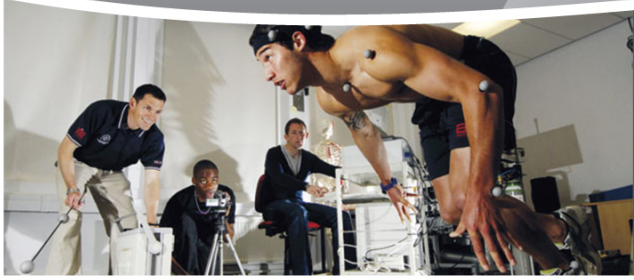

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Original Article

The Role of a Teacher of Physical Education in the Deployment of Preventive Health Awareness among Secondary School Students

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ABSTRACT

Since the researchers realize the importance of the preventive health aspect in the whole educational system and the extent of contribution of physical education teachers, we sought in this research to: determine the effectiveness of physical and sport education teachers in deploying preventive health awareness of secondary school students. The researchers used the descriptive method on a research population represented in physical and sport education teachers in Tiaret Province (124 teachers) of which we selected a random sample represented in (100 teachers). The researchers decided to design a questionnaire to measure the physical education teachers in deploying preventive health awareness for students depending on some previous literature. The study concluded that the role of physical and sport education teachers in secondary school stage is insufficient in deploying health awareness for students in secondary school stage, especially when it comes to nutrition, quality of healthy adequate foods and suitable time to eat food. In addition, there are significant differences in proposed questionnaire marks for physical education teachers attributed to the variable of educational qualification in favor of higher levels such as Master and PhD degrees in addition to professional experience variable in favor of the most experienced. The researchers recommend considering measurement in preventive health aspect through the design of tests and measurements for such purpose after application on very large samples and the necessity of promoting physical activity with preventive health condition as a society project and an enrooted culture that is transferred through generations.

Keywords: Preventive health awareness, secondary school students (adolescents), physical and sport education teachers

INTRODUCTION

The educational system in Algeria is characterized with division according to age categories, starting from preparatory education, primary education, middle education and finally secondary school stage. This latter one is the final stage of education course which lasts about twelve years of studying and hard work. Among subjects studied, there is physical and sport education. This subject is characterized with offering various benefits for students. In addition to physical and sport aspects, it may contribute to develop many aspects of the student's personality. Since sport is an effective way for education and behavior adjustment, it can be said that physical education in particular is a method for preparing young people to be able to defend themselves and their countries. Hence, countries around the world, including Algeria, are concerned with sports.

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Currently, it is scientifically proved that regular practice of medium-intensity physical activity (at least) and high fitness levels of individuals have positive effects on various functions of the body and multiple health benefits. On the contrary, physical inactivity and resorting to rest lead to a set of negative effects on both individuals and society. Statistics in the United States show that 35% of coronary heart diseases, 35% of diabetes and 32% of colon cancer deaths are attributed to physical inactivity (World Health Organization WHO 10, 2010).

Many studies concluded that health beliefs explain good practices of health habits by people. For example, they help to predict other practices that aim to protect the teeth and caring after them (Champion, 1990), protection and prevention from obesity (Mohamed, 2005). Because of the importance of health awareness, a lot of studies at different educational levels were conducted (including Al Qaddumi, 2005: 223 – 226) to define health awareness level and sources of obtaining health information for players in Arab volleyball clubs.

PROBLEM OF THE STUDY

Physical and sport education is among the most significant means which depend on achieving the general aim of education by helping in prepare physically, mentally, socially and psychologically fit individuals. Thus, physical and sport education development has become a necessity of life and an important duty that must be worked to be achieved by most countries, including Algeria. John Dewy considers physical and sport education as a "suitable method to adapt to life". Since physical and motor activity have has become a demanding necessity in our present days with life characterized by inactivity resulting from technological advance and spread of leisure means widely, this led to reduction of physical efforts to its lowest levels. Some statistics refer the percentage of human physical and motor works was reduced from 90% to 80%and man becomes spending about 1500 inactive hours each year.

"Move for health!". This statement was the slogan of the initiative by World Health Organization WHO in 2003. This campaign aimed to educate people concerning the importance of practicing physical activity for various age categories with its positive effect on health. In addition, there are many organizations around the world such as: (the American Center for Disease Control and Prevention, American Heart Association, The American College of Sports Medicine and European Society of Cardiology) which worked on issuing recommendations encouraging educational institutions around the world to adapt clear policies which encourage active life.

Since education is a tool for achieving human, social and economic development, many developed countries moved and directed its investments of human resources. Algeria is considered one of the countries which seek to the betterment of their education and the educational system. The best proof is the steady annual increase in this sector's budget. Moreover, the Constitution of 1963 considered education as the basis for development. Since students are the backbone of the educational process, it was necessary to consider it from all aspects. It can be denied that physical and sport education classes present an atmosphere of fun, pleasure and taking care of the body and the soul. Yet, is it enough for students in general and final stage students in particular being prospects of tomorrow? Some studies referred that the effect of healthy education in increasing awareness of societies concerning health problems and how to prevent them is not enough unless it is translated into a practical behavior.

In a study by Bulvar (Wilson, 2006), from California University on seven thousand persons of Alameda District's population, he found that there are six healthy behaviors that keep man's health and are considered from remedial behaviors. Another study discovered that sample members who adherence to all of these behaviors led to increase in age rate to be (11) years more than who practiced three of them (Taylor, 2008, p. 124).

In a study by (Recap, 2009, pp. 1-6), which aimed at how to help persons in the use of health belief model in their lives for preventing diseases in the program for health education, it summarized a list of guides and the extent of their commitment to practical ideas for health beliefs, including, for example the use of an activity or event which effectively raise the level of students because they are vulnerable to diseases, knowing how to a student recognizes diseases and their consequences, severity of sickness condition and feeling it, actions taken to avoid sickness conditions and prevention from them. In terms of daily practice, researchers moved their attention towards some wrong behaviors of students, especially in middle and secondary stages.

For the purpose of taking a look on what students receive from physical and sport education teachers

during classes, or during special circumstances such as bad weathers and lack of prepared halls, especially when it comes to preventive health aspects, it was necessary for us to study the role of physical and sport education teachers in deploying preventive health awareness for students of final stage of secondary education. Accordingly, both researchers sum up their study problem in the following questions:

Main Question

- Does the role of physical and sport education teachers in secondary stage effectively enough to deploy preventive health awareness for students of secondary education?

Secondary Questions

- Does the role of physical and sport education teachers in secondary stage effective and sufficient to deploy preventive health awareness of nutrition for students of secondary education stage?
- Does the role of physical and sport education teachers in secondary stage effective and sufficient to deploy preventive health awareness of cleanliness for students of secondary education stage?
- Can the role of physical and sport education teachers in secondary stage be considered effective and sufficient to deploy preventive health awareness of sports and healthy behaviors for students of secondary education stage?

HYPOTHESES OF THE STUDY

Main Hypothesis

- The role of physical and sport education teachers in secondary stage is not effective and insufficient to deploy preventive health awareness of nutrition for students of secondary education stage.

Secondary Hypotheses

1. The role of physical and sport education teachers in secondary stage is ineffective and insufficient to deploy preventive health awareness of nutrition for students of secondary education stage.
2. The role of physical and sport education teachers in secondary stage is ineffective and insufficient to deploy preventive health awareness of cleanliness for students of secondary education stage.
3. The role of physical and sport education teachers in secondary stage is considered ineffective and insufficient to deploy preventive health awareness of sports and healthy behaviors for students of secondary education stage.

OBJECTIVES OF THE STUDY

Main Objective

- To know how effective the role of physical and sport education teachers in secondary stage is in deploying preventive health awareness for students of secondary education stage.

Secondary Objectives

1. To know how effective the role of physical and sport education teachers in secondary stage is in deploying preventive health awareness in nutrition for students of secondary education stage.
2. To know how effective the role of physical and sport education teachers in secondary stage is in deploying preventive health awareness in cleanliness for students of secondary education stage.
3. To know how effective the role of physical and sport education teachers in secondary stage is in deploying preventive health awareness of sports and healthy behaviors for students of secondary education stage.

METHODOLOGY OF THE STUDY

The researchers used descriptive surveying method.

POPULATION AND SAMPLE OF THE STUDY

The population of the study is represented in secondary stage physical and sport education teachers in Tiaret Province for the school year 2013/2014 (124 male and female teachers) of which we selected a random sample represented in (100 teachers).

FIELDS OF THE STUDY

Human Field

The study considered physical and sport education teachers in Tiaret Province who are actually serving for the school year 2014/2015 (124 teachers) distributed on (53) secondary schools all over the province (the exploratory sample of 10 teachers was eliminated).

Time Field

This study was conducted during the period from November 2014 to March 2015.
Place: secondary schools of Tiaret Province. Questionnaires were distributed in three methods:

- First: By moving the researchers to near secondary schools and delivering the questionnaire forms to teachers.
- Second: By league of the district for school sports in Tiaret Province as this latter is considered a destination for teachers of the subject, especially those responsible for school teams within the league.
- Third: By the help of some students who study at the physical and sport education institute related to the university center at Tissemsilt Province aiming to distribute the questionnaire to secondary stages, especially far ones as one of the researchers is working as a teacher contracting with the institute.

TOOLS OF THE STUDY

Questionnaire

Method of preparing & designing the questionnaire

Depending on previous and similar literature, the researchers prepared the questionnaire in its initial form and presented it to arbitrators. After deletion and modification, the questionnaire became consisting of (46) phrases and the answer is on a ternary scale:

Correction: The researcher answers phrases of the questionnaire by choosing only one answer noting that all phrases were positive and scores as follows:

Table 1: Population of the study and sample representation percentage

	Population of the Study	Percentage	Sample of the Study	Percentage
Number of Secondary schools	53	100	36	67.92
Number of teachers	124	100	100	80.64

Table 2: Scoring method in questionnaire phrases

Scales	Always	Sometimes	Never
Scoring	03	02	01

Scientific Basics of the Tool

First step: After investigating previous literature, the researchers selected a set of studies and reviewed selections and scales used in them (Mazen & Nezar, 2008) (Al Mohanadi, 2012) (Seham, 2009) and (Sanaa, 2010).

- Validity: In face validity, the questionnaire was prepared in its initial form and ten was presented to teachers and arbitrators. In content validity, the scale ahs face validity if it measures the ability under measurement. Content validity refers to the extent of providing aspects of features in test questions. This type of validity requires a logical analysis of paragraphs and clauses of the questionnaire to determine the percentage of each of them (Abbas, 1998, 60). Therefore, the researchers suggested four themes of the questionnaire as follows:

1. First theme: personal information.
2. Second theme: nutrition:
3. Third theme: cleanliness.
4. Fourth theme: sport and healthy behaviors.

Themes that scored 80% and more are counted as agreement percentage. In addition, the researchers depended on references, sources and some of the similar researches for the purpose of thinking and logical analysis for the use of necessary and appropriate phrases as well as the appropriate themes relating to preventive health awareness that fit the research sample. All of this is in order to prepare the questionnaire in its final and clear form to submit it to the main sample o the study.

It can be noticed from the table above that arbitrators agreed on themes o the questionnaire with percentages ranging between (100%) and (88.88%) and this showed validity of themes.

Calculating Questionnaire Coefficients

Validity

The researchers obtained a questionnaire including 46 phrases in its final form. The researchers used a face

Table 3: Agreement percentage in questionnaire themes for arbitrators

Theme	Fit	Unfit	Needs modification	Agreement percentage
Nutrition	8	1	-	88,88
Cleanliness	8	-	1	88.88
Sport & healthy behaviors	9	-	0	100

validity and content validity in order to determine the validity of the questionnaire. The arbitrators stated that the final questionnaire form includes vocabulary that is intrinsically linked to the goal, and the vocabulary of form in its current case are true, accurate and comprehensive. This confirmed content validity and the researchers will also rely on self-validity after calculating reliability coefficient.

Questionnaire Reliability

The researchers used two methods to calculate reliability as follows:

First: Application & reapplication of the test

This test was conducted to ensure accuracy and stability of its results. Thus the test was conducted in two phases with an interval of a week period while maintaining the variables (same sample, same time, same place) where correlation between degrees of the first and second test marks shows test stability coefficient, as the closer this value to one (1), this test will be increasingly stable and reliable. To count reliability coefficient, the researchers used the general method for calculating the correlation coefficient of Pearson as shown in the following table.

After calculating Pearson's correlation coefficient (0.83) and determining test reliability at freedom degree of (9) with significance level 0.05, it was clear that value of Pearson's correlation coefficient for nutrition theme is (0.89), for cleanliness theme is (0.85) and sport and health behaviors is (93.0). These values are all bigger than the tabulated R value which is (0.62). This shows that questionnaire phrases have high reliability degrees. Moreover, total mark of Spearman's coefficient (0.89) is bigger than the tabulated R value at freedom degree of (9) with significance level 0.05. Thus, the questionnaire is highly reliable.

Second: Split-half reliability

Te researchers calculated reliability coefficient using the split-half method by calculating correlation coefficient between total items of even categories compared with total items of odd categories. After that, reliability coefficient was calculated using the following formula:

The previous table shows that split-half reliability values were (0.82) for total questionnaire, (0.81) for nutrition, (0.83) for cleanliness and finally (0.85) for sport and healthy behaviors which are statistically satisfactory. In order to ensure test reliability, we used self-reliability which is measured by calculating square root of the test's correlation coefficient with results as follows:

Objectivity

Objectivity means freedom from bias, prejudice, and not to introduce personal factors in judgments issued by the researcher (Al-Issawi, 2003, p. 332). Respondents were provided with all details and requirements to answer the questionnaire by clarifying the method of answering. The researchers also committed, through the distribution of forms, to take into account the nature of individuals, questionnaire administration, and the degree of motivation among respondents.

Method of Questionnaire Evaluation

After collecting forms from sample of the study, the researchers calculated the mark of each individual in each theme and the questionnaire as a whole as:

If the answer is "start" = one 1 mark, "sometimes" = 2 two marks and "always" = 3 three marks.

DISCUSSING RESULTS

First: results of the main hypothesis: "The role of physical and sport education teachers in secondary stage is not effective and insufficient to deploy preventive health awareness of nutrition for students of secondary education stage". To ensure this hypothesis, the researchers calculated Chi2 value for each theme with results in the table below:

Results of Questionnaire Themes

From above table, it can be said that the role of physical and sport education teachers was ineffective

Table 4: Reliability coefficient by Pearson

	Calculated R value	Pearson coefficient	Significance level	Freedom degree	Tabulated R value
Nutrition	0.81	0.89			
Cleanliness	0.75	0.85	0.05	9	0.62
Behaviors	0.88	0.93			
Total mark		0.89			

and insufficient to deploy health preventive awareness as questionnaire themes were statistically significant. Thus, nutrition, cleanliness, sport and healthy behavior hypotheses can be achieved.

Discussing Hypotheses of the Study

Selection of all data is based on many factors such as nature of the problem and hypotheses control tool selection (Ekhlas & Moustafa, 2000, 143). For the purpose of employing data and results of the field study and to solve the problem of the study, the researchers will discuss hypotheses' results.

Discussing Results of First Hypothesis: "The role of physical and sport education teachers in secondary stage is not effective and insufficient to deploy preventive health awareness for students of secondary education stage"

Through the study results, of the field study, specifically in the Table 7 where the values of (Chi2) for the majority of the questionnaire phrases and in the three themes are statistically significant. Thus, the overall findings of the questionnaire were statistically significant and therefore the hypothesis was achieved. This what was concluded by some of the studies such as (Al Maneef, 2005), which concluded that the educational staff in schools has a poor understanding of school health, and recommended the need to strengthen supervisors to participate in educational sessions.

Table 5: Split-Half reliability values

Theme	Split-Half reliability values
Nutrition	0.81
Cleanliness	0.83
Sport & healthy behaviors	0.85
Total questionnaire	0.82

In addition, the study of (Badah, 2007) recommended increasing attention to the training of assistant medical personnel by supervisors on school health services as well as training of teachers and those responsible for providing school health services. Moreover, the study of (Rashad, 1987), which reached an insufficient health concepts with female teachers in nurseries in five areas of health, including nutrition.

On the other hand, researchers attribute this result to the size and number of students in the department which does not allow teachers to prompt and transfer some advices, guidance and practices that may be beneficial in health, especially in preventive aspect despite hard efforts exerted by subject teachers.

CONCLUSIONS

Through the study problem treated using adequate statistical means, the researchers reached the following findings:

- The role of physical and sport education teachers in secondary stage is not effective and insufficient to deploy preventive health awareness for students of secondary education stage in terms of nutrition, cleanliness, sport and healthy behaviors.
- There are statistically significant differences in the proposed questionnaire for physical and sport education teachers attributed to the variable of educational qualification in favor of higher levels such as Master and PhD degrees with professional experience in favor of the most experienced.

RECOMMENDATIONS

After discussing and analyzing results, the researchers recommend the following:

Table 6: Questionwability

Item	Sample size	Freedom degree	Significance level	Correlation coefficient	Validity coefficient
Role of physical & sport education teachers	10	08	0.05	0.81	0.90

Table 7: Chi2 test results for questionnaire themes for sample members in nutrition

Items	Calculated Chi2	Tabulated Chi2	Significance level	Freedom degree	Significance
Nutrition	9.32				Significant
Cleanliness	8.64	5.99	0.05	2	Significant
Sport & healthy behaviors	11.67				Significant

1 The necessity to consider preventive health awareness measurement through designing tests and scales for this purpose after application on a very big sample.
2 We should think more seriously in the contribution of physical education in particular and sports in general in general health problems considering them among the best means of prevention from diseases, physical, psychological and behavioral disorders.
3 Promoting physical activity with preventive health aspect as a society project and enrooted culture through generations such as: dedicating public days and demonstrations, encouraging movement, establishing the "Sport is for All" principle for all age categories and various classes, positive participation by parents even for some time and even by symbolic participation.

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ANNEXES

First theme: Nutrition

No.	Phrases	Always	Sometimes	Never
01	Do students consider not buying foods displayed in streets?			
02	Do students consider reading expiry date of products?			
03	Do you warn students from depending on ready-made foods?			
04	Do you give students wrong information about healthy foods?			
05	Do you encourage students to drink big amounts of water, especially in hot weathers?			
06	Do you explain to students the relation between food and sport activity?			
07	Do you warn students not to practice physical effort right after eating?			
08	Do you encourage students to eat fruit and vegetables?			
09	Do you notify students not to over drink fizzy drinks?			
10	Do you notify students that right nutrition prevents from obesity?			
11	Do you notify students not to eat great amounts of salts?			
12	Do you encourage students to oil milk before drinking it?			
13	Do you encourage students to keep suitable weight?			
14	Do you notify students to reduce eating fried foods?			
15	Do you notify students that obesity is one of the features of malnutrition?			
16	Do you warn students that overweight causes back pain and Arteriosclerosis?			

Second theme: Cleanliness

No.	Phrases	Always	Sometimes	Never
01	Do you notify students to the necessity of washing after physical effort?			
02	Do you notify students to the necessity of practicing physical activity in clean places?			
03	Do you notify students to the necessity of clean clothes as they are important for health?			
04	Do you notify students to the necessity of using suitable shoes during practicing physical activity?			
05	Do you notify students to the necessity of cutting nails to limit the spread of germs?			
06	Do you notify students not to use clothes and tool of others?			
07	Do you notify students not to spit in fields which may cause injury?			
08	Do you notify students to the necessity of using clean toilets?			
09	Do you notify students not to use one towel for all family members?			
10	Do you notify students to the necessity of consistent care of hygiene?			
11	Do you explain some first aids for students?			
12	Do you notify students to the necessity of using toothpaste and toothbrush in cleaning teeth?			
13	Do you watch hair and nail cleaning?			
14	Do you notify students to the necessity of opening home windows periodically?			

Third theme: Sports & healthy behaviors

No.	Phrases	Always	Sometimes	Never
01	Do you encourage students to dedicate time to practice some sport training?			
02	Do you order students to stop practicing sport activities upon injury?			
03	Do you explain to students how body organs function?			
04	Do you explain to students how practicing sport activities help the body in performing its functions?			
05	Do you encourage students to the danger of watching TV from a close distance?			
06	Do you encourage students to the necessity of opening home windows periodically?			
07	Do you encourage students to the necessity of considering sleeping hours?			
08	Do you explain to students how to sit correctly?			
09	Do you encourage students to the necessity of avoiding passive smoking?			
10	Do you order students to remove harmful things upon practicing any physical activity?			
11	Do you advice students to the necessity of rest after feeling fatigue and tiredness?			
12	Do you encourage students to walk 20 minutes at least every day?			
13	Di you encourage students to do good warming-up in cold weather?			
14	Do you evaluate information related to individual health during the class?			
15	Does the physical education teacher play an important role in school health?			
16	Do you work on establishing good preventive healthy habits?			

The Swedish Journal of Scientific Research

Original Article

The Effect of using Flexible Grouping Strategy based on Sensory Motor Perception Training in Learning Some Volleyball Skills

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ABSTRACT

The problem of the study was clear that despite the multiplicity of strategies, methods and styles of teaching in the educational process, but the teaching process is still limited to the use of strategies and methods of traditional teaching, particularly in physical education materials that are practical. Strategies are characterized with clear control of the teacher without interference or giving the relative freedom to the student. This is greatly reflected on students from negative side as well as the failure to promote an atmosphere of competition between students and this is noted by researchers through their work as teachers and through their field visits to schools during application periods. In addition, the teaching staff of physical education lacks the change and to identify the latest trends in teaching methods including strategies and methods. Therefore, the study aimed to prepare special educational modules using flexible grouping strategy based on sensory motor perception training in learning some volleyball skills as well as to find out the impact of using of flexible grouping strategy based on sensory motor perception training in learning some volleyball skills. The researchers used the empirical method and selected the sample consisting of 60 students from middle stage, the fifth grade literature section, with tests used in the research, exploratory trial, pre-tests and application of educational modules on the sample of the study and post-tests. The researchers found the experimental group is better than the control group as it used flexible grouping strategy based on sensory motor perception training in learning some volleyball skills.

Keywords: Flexible grouping strategy, sensory motor perception, volleyball

INTRODUCTION & SIGNIFICANCE OF THE STUDY

The current development in various sciences and disciplines around the world is unprecedented. Organization and educational outputs become unable to keep up with this great progress, so it was necessary to change planning, implementation and evaluation in educational outputs.

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In spite of studies, researches, assertions and modern psychological and educational literature and modern with their implications are necessary to activate teaching methods and means in a way that stimulates and develops the role of learners and makes them active, supportive and effective in the educational process. However, they still suffer from some non-viable accumulations, which are reflected negatively on the learner and are restricted to make the learner receive limited knowledge through listening and traditional prompting in various fields of science, including physical education and sports sciences. The teacher who masters the use of strategies and different teaching methods is the one who makes the lesson characterized by flexibility and vitality with his own style reflected on learners and makes them interact with lesson through the good performance of exercise and producing the

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educational unit in a way that suits the level and abilities of learners, which in turn gives the advantage to learn those sport skills.

Therefore, a teacher should work to organize his lesson explanation process with consideration to individual differences among learners, their correct physical, skill, psychological and mental conditioning in order to reach the best responses by learners.

Sensory motor perception appears in various sport events including volleyball as it is prominent in most moves through sensing movement and perceiving its divisions. This comes through performance of the needed movement from learners which can be improved through motivating training. In addition, volleyball is considered one of the team games that are characterized with frequent attention to team members, opponents and ball. It also needs motor, skill and physical abilities with quite high degree by not contacting the opponent team's players. Thus, it needs compound training, especially in terms of feeling and perception of distance and time.

Here, the significance of the study lies in the fact that a teacher uses flexible grouping strategy in teaching with inclusion of sensory motor perception training which improves learner's volleyball abilities and its effect on motivating and learning skills.

PROBLEM OF THE STUDY

Volleyball is one of the sport games that require a set of motor and physical abilities in order to produce skills flexibly and consistently. It requires mastering skills and motor mastery which is derived from perceptive and sensory abilities that depend on motor adjustment. Despite the multiplicity of strategies, methods and styles of teaching in the educational process, but the teaching process is still limited to the use of strategies and methods of traditional teaching, particularly in physical education materials that are practical. Strategies are characterized with clear control of the teacher without interference or giving the relative freedom to the student. This is greatly reflected on students from negative side as well as the failure to promote an atmosphere of competition between students and this is noted by researchers through their work as teachers and through their field visits to schools during application periods. In addition, the teaching staff of physical education lacks the change and to identify the latest trends in teaching methods including strategies and methods and weakness of students in terms of movement sensing, perception and learning. This motivated the researchers to study this real problem and find solution for it. This is done through the use of flexible grouping strategy based on sensory motor perception training in learning some volleyball skills.

OBJECTIVES OF THE STUDY

The study aimed to:

- Prepare special educational modules using flexible grouping strategy based on sensory motor perception training in learning some volleyball skills.
- Finding out the impact of using of flexible grouping strategy based on sensory motor perception training in learning some volleyball skills (underhand passing and forward underhand serving).

METHODOLOGY OF THE STUDY

The researchers used the empirical method.

Sample of the Study

The selected sample is from students at fifth grade literature section in Al Khadra' Model School – Baghdad/Al Karkh 1 for the year 2013 – 2014. The sample was selected purposively with a number of (90) students distributed on 3 halls (A, B and C). Students in exploratory trial and absent students were eliminated with a hall not included in the main trial (total 30 students eliminated). Thus, the sample was (60) students constituting 66.66%. Hall C was selected for the empirical group (30 students) and Hall B for the control group (30 students).

Sample Homogeneity

The researchers performed sample homogeneity in length, age and weight for all sample members as shown in Table 1:

Tests of the Study

1 Measuring underhand passing with the ball (Clifton Volleyball) (Mohamed Hassan Allawi & Mohamed Nasr El Din, 1987, 325).
2 Forward underhand serving (Mohamed Sobhy Hassanin & Hamdy Abdul Moneim).

Table 1: Sample homogeneity in length, age & weight

Variables	Arithmetic mean	Standard deviation S.D	Median	Skewness coefficient
Age	17,70	0,67	17,29	1,00
Length	171,99	2,15	173	0,540
Weight	65,75	2,40	66,01	0,360

The table showed that skewness coefficient in variables is between real limits (±3), so the sample is homogeneous

Exploratory Trial

The researchers performed the exploratory trial on a sample of students eliminated from the main trial (10 students) on 10/11/2013. The trial was repeated after seven days since 17/11/2013 and resulted in:

- Determining the time of explaining skills, overcoming some difficulties faced by researchers, consideration of respondents' safety, getting to know tests and how to be applied by the assistant team.

The selected tests in the study depend on scientific basics and applied on Iraqi environment, but the researchers decided to apply these basics on a sample of (10) students and as shown in Table 2.

Pre-test

The researchers conducted pre-tests including the following tests: (Underhand passing and forward underhand serving) on the sample and in the indoor sport hall in the school on 24/11/2013 applied by specialist teachers in physical education under researchers' supervision.

Using Flexible Grouping Strategy based on Sensory Motor Perception Training

The researchers decided to include special educational units prepared by them and including flexible grouping strategy based on sensory motor perception training in into the adopted course by Al Karkh 1 Educational Directorate. The units included the use of flexible grouping strategy and students were divided into small groups not more than (8) students for the single group equal or not equal in numbers based on the required formation and purpose. The student is free to move in return for another partner's come back to the group. The application is based on sensory motor perception in learning skills under study. There were (8) educational units distributed as 2 units a week, (4) units for each skill and the period of the single unit is (45 min). Application of units started from 01/12/2013 to 25/12/2013.

Table 2: Reliability, validity and objectivity

Variables	Validity	Reliability	Objectivity
Underhand passing	0.90	0.81	0.94
Forward underhand serving	0.92	0.85	0.95

The counted (R) value was bigger than the tabulated one (0.52) at freedom degree (8) and under significance level (0.05) and the tests obtained a high degree of validity, reliability and objectivity

Post-tests

The researchers conducted post-tests on the sample of the study and on the empirical and control groups at the same sport hall by the applied by the same teachers who applied pre-tests as post-tests were conducted on 29/12/2013.

DISCUSSING RESULTS

Discussing Results of Pre- and Post-tests for Empirical & Control Groups for Underhand Forward Serving and Underhand Passing in Volleyball

Table 3 shows that the empirical group excelled in skill tests (underhand passing and forward underhand serving) in favor of post-test. The researchers attribute this to the use of flexible grouping strategy based on sensory motor perception training to be included in the course in the form of special educational units for skills under study which were used in a consistent and scientific way. The groups were divided into small sub-groups that gave strong motivation to learners to participate effectively. This agave them movement flexibility between both groups and the learner becomes the axis of educational process with growing social responsibility, team work and development. The teacher here becomes a guide and director (the flexible grouping strategy is based on making each student in the group has an effective role confirming his/her activity. Thus, the exerted effort in educational situations may lead to keep the learning effect, function and transfer (Ziad Barakat, 2005, 4).

In addition, sensory motor perception training played a role in advancing the empirical groups as they were prepared in a way that is consistent with learners and their ages in coordination with the used strategy. It played a significant role too through sensing and

Table 3 : Arithmetic means, standard deviations S.D, calculated & tabulated (T) values in pre- and post-tests for skills under study in volleyball for empirical & control groups

Skills	Group	Pre-test		Post-test		Calculated T value	Tabulated T value	Significance
		+ Mean	S.D	+ Mean	S.D			
Forward underhand serving	Empirical group	19,0	1.70	23,1	1,20	10,96	1.69	Significant
	Control group	18,7	1,50	20,7	0,89	4,95		Significant
Underhand passing	Empirical group	11,20	2,90	16,23	2,10	4,07		Significant
	Control group	9,4	2,10	12,86	1,30	2,90		Significant

*The tabulated (R) value is (1.69) under significance level (0.05) and freedom degree (29)

perceiving skills as sensory knowledge is of a great importance in sport motor work consistent with the ability of perceiving all phenomena shown in a distinctive way in educational process.

(Sensory receptors in muscles send sensory signals which carry information about the extent of muscle extension or contraction, loosening, tensioning, speed and strength of muscle contraction, different body postures as a whole, changes in these parts, accuracy of movement in these parts and accuracy of movement in the surrounding space with performance time. Thus, this information helps in accurate estimation of motor performance by players through the nervous system's control over performing acquired movements and mastering their performance during motor learning processes) (Hashem Al Kilany, 2005, 70).

Therefore, we believe that the advance of the empirical group came mixed through the use of flexible grouping strategy with sensory motor perception training which motivated learners to learn the skills shown through results obtained by the empirical group. In addition, it was found that the control group excelled in post-tests.

Discussing Results of Post-tests for Empirical & Control Groups in Coordination and some Volleyball Skills

Table 3 shows that the empirical group which used flexible grouping strategy based on sensory motor perception training in learning was more effective on volleyball skills. This asserts the effectiveness of teaching using flexible grouping strategy based on sensory motor perception training in learning which were consistent through variable groups in number and their places in learning skills. They played an effective role for the empirical group's advance. Since teaching based on flexible grouping strategy as an educational unit including a specific subject which, in turn, includes learning elements maybe different and complex with the main goal to increase interaction of students and effective participation in various activities desired by flexible groupings in the single educational situation in order to achieve the specific educational goal of the educational unit with high efficiency. Through these activities, a learner can move from a group into another giving the freedom in selecting suitable groups and estimating group levels through the guiding and supervising teacher (flexible grouping strategy is one of the most important strategies through which a learner is able to use various teaching methods and match educational activities with needs and abilities of students with achieving societal objectives or equal comprehensive development for all students despite differences among them) (Fad Khalil Ibrahim, 2010, 58 – 59)

The flexible grouping strategy refers to free movement of students through groups in the knowledge of teachers with follow-up of all learners through movement and mobility among groups to facilitate learning process and following-up all learners. Tools and suitable place are prepared for this purpose providing each group with learning sources separately and for the rest of groups. Learners can also be evaluated by the teacher separately with educational units related to teaching using flexible grouping strategy. Activities were designed based on needs and objectives of subjects considering consecutive presentation of skills' contents and individual differences among learners. In addition, a set of exercises were presented to allow learners an opportunity in practice and performing required duties in educational situations (teaching with the use of flexible grouping strategy is characterized with flexibility in selecting ad learning activities according to self-speed and ability in learning and providing circumstances that give learners positive roles in each educational situation) (Rober, 1990, 90).

Table 4: Arithmetic means, standard deviations S.D in post-tests for volleyball skills for empirical & control groups

Skills	Empirical group		Control group		Calculated T value	Tabulated T value	Significance
	+ Mean	S.D	+ Mean	S.D			
Forward underhand serving	23,1	1,20	20,7	0,89	6,94	1.68	Significant
Underhand passing	16,23	2,10	12,86	1,30	3,80		Significant

*The tabulated (T) value is (1.68) under significance level (0.05) and freedom degree (58)

The advance in the group studied using flexible grouping strategy has a significant effect on learners' participation which is the most important quality in teaching as learners engage and participate in a way that exceeds their being receptors of information only, but they participate in educational activities in an excellent and consistent way throughout educational units. Moreover, sensory motor exercises have an effect on enhancing motor adjustment and advancing volleyball skills as it considered mental abilities by selecting exercises in a way that the sensory motor perception is mainly linked to central nervous system which is considered one of the most important results of brain related to knowledge and higher mental processes represented in perception, sensing, remembering and sight. Accordingly, these processes are the main axes of knowledge organization for learners as it is hard for learners to perceive motor behaviors in absence of one of these main axes (performance aesthetics and development is determined by developing perceptive processes as a result of players being subject to assisting training means that develop these abilities). This led to develop ball sensing because of the strength of nervous processes from which an increase in perceiving outer space (Mohamed Hassan Allawi et al, 2003, 48).

Sensory perception has a direct effect on learning and enhancing skill performance and accuracy with acquisition of new skills in addition to learning and playing situations, especially at serving and passing needing touching and sighting senses and other internal senses such as sensing direction, distance and time more than any other sense, which attributes to learners wide horizons in perceiving the biggest set of variables surrounding performance (sensory motor perceptions can be improved through advanced exercises related to such perceptions) (Khaled Shawki, 1998, 83). These exercises develop sensory-motor perception of skills which helps learners achieve more understanding to the nature of performing the needed skills, which makes learners succeed in performing motor skills. In addition, continuous training leads to increase learner's ability on skill performance concentration. This, in turn, led to develop perceptions (the more the training period is for players, the more their experience and skills in various playing situations) (Eman Hamad, 1998, 34).

The exercises were selected in a regular manner with graded difficulty and consistent body limbs and functional effect on developing coordination between muscular and nervous systems in which physical abilities are involved (developing coordination is considered one of the main goals of physical education) (Abu El Ela Ahmed, 1997, 205).

In addition, the flexible grouping strategy based on sensory motor perception training in learning have a clear effect on advancing the empirical group in all skills as they were prepared in a consistent manner to the sample in terms of estimating position and directing ability in terms of time, place and control of body movement, perception of body position and changes in the field, movement, the ability of motor connection and coordination. These factors give quality of exercises prepared by the researchers in which the focus was on enhancing motor coordination among parts of the body and volleyball skills improving learners' movement. Through results, we notice the advance of the empirical group which used teaching using flexible grouping strategy based on sensory motor perception in all volleyball skills.

CONCLUSION

1 Results showed excellence of the empirical group which used teaching with flexible grouping strategy based on sensory motor perception training in learning some volleyball skills over the control group.
2 The proposed educational units including teaching with flexible grouping strategy and sensory motor perception training have positive effect as assistance exercise in acquiring perception and motor coordination in volleyball.
3 Results showed enhancement of the control group which used teaching adopted by teachers in learning volleyball skills.

RECOMMENDATIONS

1 To work on benefiting from findings of the current study for learning and developing sensory motor perception and some volleyball skills in the field of teaching volleyball in middle schools in the Ministry of Education.
2 To conduct similar studies on other samples and games.

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Annex 1: Model of an education unit

Educational objective: Learning underhand serving skill		**Unit: First**	**Grade: 5th ( )**		
Number of students: 30		**Event: Volleyball**	**Date: / /2015**		
Pedagogical objective: Order and respect		**Tools: Chalk marks, volleyball**		**Time: 45 min**	
Time/min	**Unit parts**		**Explaining event or skill**	**Order & formation**	**Notes**
10 min	Preparation part	Administrative side (2 min)	Attendance and preparing tools	xxxxxxxxx ◯	Ensuring silence & order
		Front (3 min)	General preparation of all body organs	x x x x x x x x x x x x x x x	Ensuring the most important muscle groups involved in the skill
		Physical training (5 min)	Performing exercises of body parts (jump, balance, neck, arms, trunks, feet)		Explaining the skill of underhand serving
30 min	Main part	Educational section 10 min	The teacher explains underhand serving skill, performs a model ensuring movement parts and model of students	xxxxxxxxxxx x x x x	Explaining underhand serving skill
		Applied section 20 min	• Students divided into two groups, underhand serving to the partner on a distance of (3m) and increase distance • Serving in front of the net to the partner in the other half of the field • Drawing a line (2m) away from center line, other line away (2m) and other (1m) away. The student throws the ball on these lines blindfolded • Determine baseline and other line (10 cm) away. The student stands on the baseline and throws the ball in a way that makes it fall on the second line (blindfolded)	2 teams 4 teams 4 teams 4 teams	External feedback coming directly Participation and playing roles of students
5 min	Final part 3 min 3 min		Preparation and relaxing training to restore normal body position and then dismissal	x x ◯ x x	Keeping order

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Article Article

Design and Manufacture of the Electronic Device to Measure the Compatibility and Speed of Motor Response Lower Limbs Fencing

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ABSTRACT

To select players for the sport of fencing requires from the coaches characteristics of compatibility and responding motor speed. The coaches are working hard during the training period. They strive to develop them. The problem of the selection in the measurement of these two characteristics is made through some manual tests of time calculating by someone. This method does not give sufficient objectivity in measurement because there is a lag of time between, on one hand the player movement during the start and finish and on the other hand the speed of the movement of the manual timer (it coincides in pressing the timer during the starting or stopping time at the end of the movement). Study aimed to design a sensitive electronic device that works in two ways to measure the compatibility and agility to respond the lower limbs with high accuracy and through the movement of the player tested themselves and consistently high. Use descriptive approach to students in the third stage and studied fencing of their number (57) students for the academic year (2015-2016). After manufacturing and rationing device and tests performed it for the purpose of the statement of the efficiency and quality of the designer machine and the factory has been applied compatibility testing and the speed of the motor response to the sample of the research concluded:

1. The plant device is an electronic device is sensitive with precision high- quality, made for the first time in the sports field to measure (synergy+ kinetic speed of response).
2. The first works in a different ways to measure the synergy and the second to measure the kinetic response speed of the lower limps.
3. The way to measure at the same time for training to develop those capabilities.
4. The mothed of manufacturing a simple, inexpensive, fast and raw materials available in the local markets and high quality, and sends a thrill of excitement through its use.

Keywords: Manufacturer-electronic device, Compatibility, Responding motor speed, Fencing

INTRODUCTION

Fencing is a sport of attack and defense and precedence touching an opponent so it requires from its practitioners a lofty physical perform in order to reach the planned results. Fencing player needs to be good at using the movements of two feet's and arms in the attack, defense and coordination with the work of the nervous system to integrate and implement movements of different types of high speed, and in line with the performance skills, that means perform any number of compound movements at a time without work or additional complementary movements or restore the attack again. Because fencing movements are generally characterized by small and precise performance of kinetic range. Fencing player must take into his consideration the

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compatibility and speed of response of the kinetic parameters, that is one of the important factors to reach the goal of an opponent easily. Fencing player should work on the integration of different movements in the context characterized by streamline and consistency and good performance through consensus foot and arm and the goal of the opponent and the movement of a quick compromise.

The compatibility is the coordination and integration of parts in the movements which is reflecting the good performance and the beauty of the movement. The performance either consists a single movement or a chain of kinetic movements, it requires mainstreaming of many movements, this what (Williams) conforms, the compatibility is the ability to coordination and integration between the compound and an independent means of different methods of sensory patterns in the kinetics of elaborate systems, and the more the need for a level of coordination and integration has increased and this indicates agood performance and adequacy (7:42).

So to select players for the sport of fencing requires from the coaches characteristics of compatibility and responding motor speed. The coaches are working hard during the training period. They strive to develop them. The problem of the selection in the measurement of these two characteristics is made through some manual tests of time calculating by someone. This method does not give sufficient objectivity in measurement because there is a lag of time between, on one hand the player movement during the start and finish and on the other hand the speed of the movement of the manual timer (it coincides in pressing the timer during the starting or stopping time at the end of the movement).

So the two researchers strove through the design of a sensitive electronic device which works in two ways to calculate the compatibility and agility to respond the lower limbs with high accuracy and through the movement of the player tested herself and consistently high.

So the study aimed to design and manufacture an electronic device to measure the compatibility and the kinetic response speed of the lower limbs.

RESEARCH PROCEDURES

Research methology

Use descriptive approach to solve the problem of the research.

Table 1: The specifications of the sample

Statistical methods	Chronological Age/year	Mass/Kg	Height/cm
Arithmetic mean	22.11	64.18	166.7
Medium	22	65	167
Aberration Standard	1.04	3.78	3.24
Coefficient of twisting	0.39	0.94	1.8

As the coefficient of twisting sandwiched between±3 , that means the research sample has a normal distribution

The Society and a Sample of the Research

The research community was limited and appointed by the students of the third stage, in the study of fencing, their number were about (57) students, for the academic year (2015-2016) and they were divided as follows.

(28) students as a rationing sample (the experience of an exploratory) to make the scientific foundations of the device.

(26) students as an application sample.

(3) students have been excluded for the lack of their presence in the tests.

(absence); thus the sample ratio of the society will be (rationing sample+ application) (94.7%) The table (1) shows the specifications of the sample.

Devices, tools and the means of gathering information

- A device is made to measure the compatibility and responding motor speed.
- Notebook, pens to write down the data and notes.
- Photographic camera.
- Arabic and foreign sources and references.
- International information network, internet.
- Observations and experimentation.
- Personal interviews.
- Assistant team.
- Fence arm.
- Timer.
- Pieces of chalk + adhesive tape +one color cards.

Design and manufacture the device

The two researchers worked on design and manufacture a device to measure the compatibility and speed of

motor response of the lower limbs for the fencing players. Following are the details of the device.

Device componants

The device name: It is an electronic device to measure the compatibility and speed of motor response lower limbs fencing, the device consists of:

1) The main mother board: (123 cm length – 123 cm width – 15 cm height). As it is shown in Figure (1).
2) A square accessory connected with the motherboard, in separated from it: (61 cm length –33 cm width– 15 cm height).As it is shown in Figure (2).
3) The beginning base (start):
   a. Fiberglass board: (32 cm length –30 cm width–2 mm height).
   b. A square wooden piece: Its measurements are the same as the fiberglass measurements a bore.
   c. Platinum 2 pieces.
   d. Spring: 30 cm length – 15 cm the diameter – 1 kg the compressive strength.
   e. A lamp: 220 volt lamp is fixed inside the spring.
4) Spring: They are (10),distributed on the tenth circles,that each circle has one spring 30 cm length 15 cm diameter – its compressive strength is 1 kg. As it is illustrated in figure (3).
5) Lamp: (10) lamps are distributed on the tenth circles, that each circle has a lamp 220 v, they are fixed inside the spring, they are numbered (1-10),

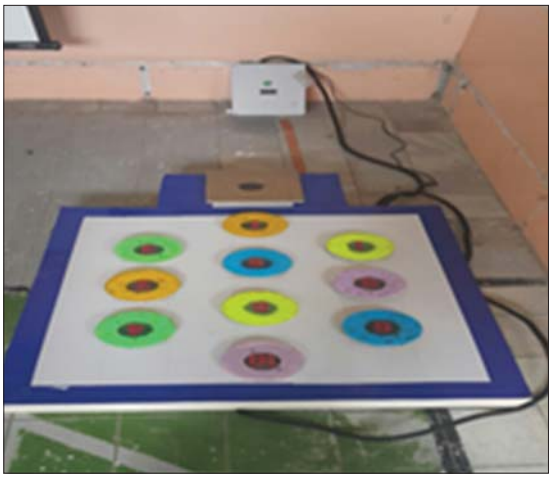

Figure 1: Shows the main motherboard

Figure 2: Shows the motherboard accessory and the beginning base (start)

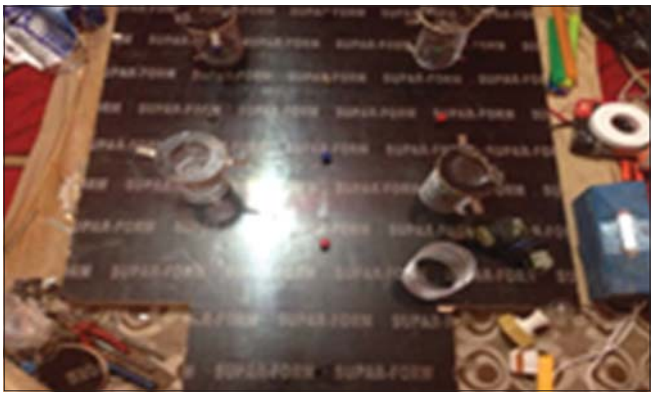

Figure 3: Illustrates the spring

Figure 4: Is illustrated that the lamps are illuminated

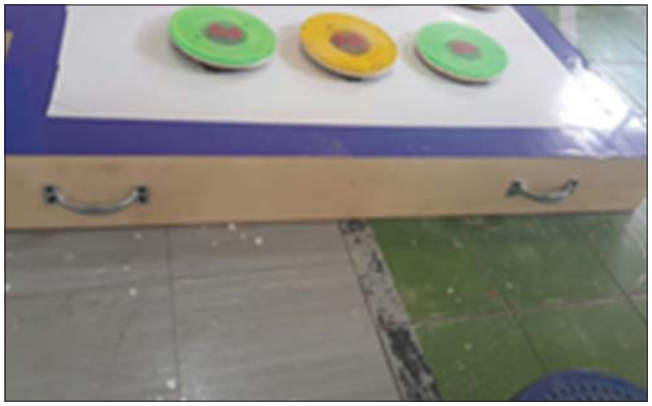

Figure 5: Illustrated the handles

so these lamps have different colors, that each two lamps has one color,series linkage lamps. 1+2 lamps have orange color, 3+4 lamps have green color, 5+6 lamps have blue color, 7+8 lamps have yellow color, 9+10 lamps have pink color, As it is illustrated in figure (4).

6) The wooden pieces: these wooden pieces are round and pierced from the middle, the measurement of its diameter is (15 cm), they are (10) wooden pieces, distributed on a number of the lamps and the springs, each wooden piece has its own number, and fixed on the motherboard, the spring and the lamp are fixed under it and the fiberglass is fixed on it.
7) Glasses boards (fiberglass):- Their shapes are round, each one its diameter(15cm), they are (10) and they are distributed and fixed on the wooden boards, they are numbered from (1-10), these glasses boards (fiberglass). However, they are unbreakable and bear high pressure and weight up to (150 kg).
8) Handles: The device has four steel handles to facilitate carry and move the device from one place to another, as it is illustrated in figure (5).
9) Platinum: They are (20), distributed to the tenth lamps, that each lamp has (2) pieces of platinum.
10) The control board (The board):- It is a box with a door and a lock, it is (40cm) length – (30 cm) width – (17 cm) height + (220 v), as it is illustrated in figure (6), it has four hangers for hanging it on the wall.
11) Switch in order to turn on and off.
12) Electronic counter calculates seconds and parts of seconds.
13) Circuit breaker (1).
14) Relay (11) they are numbered, each relay belongs to the lamp which is numbered the same.
15) Connecting cable: To connect the power into the device, 1.5m length.
16) Stran connection cable: It's a group of stran wires, its size 0.25 mm, they are (11) wires, they connect from one side to the device that they are distributed and connected to the lamps and from another side they are connected to the board that stretching inside the board so each wire connect to a relay, the length of these wires (5 m) and they are preserved inside (5 m) long cover.

Figure 6: Illustrates the control board and the counter.

Figure 7: illustrates the cover that contains the wires inside it.

How the device works

The device works in two ways:-

The first way:

In case of measuring the kinetic compatibility for the lower limbs, the device is connected to the power so the electronic counter starts to countdown to the zero degree and when the tester goes up to the beginning point, then all the lamps will be illuminated and when the start signal is given, the tester will be moved from the starting board so that the right foot is placed on the odd numbers and the left foot on the even numbers, knowing each two numbers with one color is connected with series connection.

When thefeet are Lifted from the start board, the time counter (the timer) will begin to operate it electronically and automatically, and here the tester should be moved among the circles with numerical sequence and succession that the right foot is placed on the odd numbers and the left foot is placed on the even numbers, that when the right foot is placed on the number (1) the light of the limp is still on until the foot is placed on the number (2) and after that is moved into (3+4) so (1+2) lamps are off, thus until the tester reach to the number (10) and then dismounting from the device that all the lamps are off and the time is stopped from the moment of learing the device by the tester, when the testing is repeated on another tester, the device should be rested to start once again.

Thus the time is calculated from the moment of leaving the start point to the moment of leaving the circle number (10), so whenever time is less this indicates that the tester has a high nervous and muscular compatibility between the lower limbs and the eyes and vice versa, whenever the time of the moving among the circles is more this indicates that the tester has a weak nervous and muscular compatibility.

The second way

In case of measuring the speed of motor response, here the tester stand on the start point and the lamps are manually illuminated arbitrary by the counter or the assistant who is operating the device, here time is calculated to turn off ten lamps from the moment of leaving the foot of the tester the start point to the moment of pushing on the lamp, then time is calculated automatically from the moment of leaving the lamp up to leaving the device platform and that is made after finishing the pushing on all the lamps.

The scientific foundations of rationing the device and the method of using it

Honesty

After the completion of the designing and manufacturing the device, the procedure of testing the honesty had been made to it through:

First: The honesty of the content

It has been presented on a group of experts and specialists in the field of tests measurement and fencing sport, they confirmed its validity to measure the compatibility and the speed of kinetic response of the lower limbs in the fencing sport with (100%) harmonic ratio.

Second: The discriminatory power:

It is the ability of the device to discriminate individuals who have high compatibility and speed of response from those who have low compatibility and speed of response (28) students from the third stage had been chosen arbitrary in the fencing lesson and after discharging the results and arranging them by counting them down from the highest degree to the lowest degree, (27%) ratio from the highest degrees had been chosen in the test of the compatibility and the speed of kinetic response, and (27%) from the lowest degrees, thus, the number of each group(7) students, i.e. that the number of the results of the students who are subject to the analysis are (14) students. The second test had been used for two independent samples for knowing the differences between the averages of the high group and the low group. In the tests of the compatibility and the speed of kinetic response. The (T) value that was calculated according to the level of the error that was prepared as a mark to distinguish the test by comparing it by the level of an indication (0.05), obviously the test of the compatibility and the test of speed response were distinguished, that the value of the level of error was less than the level of an indication (o,o5). As it is illustrated in the table (2).

Stability

(28) students from the third stage had been tested in the fencing lesson on the device to measure the compatibility and the speed of kinetic response, seven days later the test had been repeated once again. After making the coefficient of stability between the two tests that illustrate the value of the coefficient of stability was very high, i,e, the device has the high accuracy, objectivity and quality to measure the compatibility and the speed of kinetic response for the lower limbs in the fencing. Table (3) illustrates that.

objectivity

It is meant there is no disagreement of the coaches to estimate something, since themethod of registering the results of the compatibility and the speed of kinetic response had been subjectively made by the device depending on the movement of the tester on the device.

Table 2: The discriminatory power to test the compatibility and the speed of the kinetic response of the manufactured device

Tests	Group	Arithmetic mean	The standard of deviation	The (T) measured value	Level of error	Indication of the difference
Compatibility	High group	5.24	0.48	6.1	0.000	Moral
	Low group	8.42	1.2			
Speed of kinetic response	High group	5	0.81	5.3	0.000	Moral
	Low group	7.14	0.69			

Moral at a level of indication ≤0.05

Table 3: The stability to test the compatibility and the speed of kinetic response for the manufactured device

Test	Coefficient of connection	Level of the error	Indication
Compatibility	0.97	0.000	Moral
Speed of kinetic response	0.91	0.000	Moral

Moral at the level of indication ≤0.05

Timing starts from the beginning of her movement and end at the end of her movement. There is no subjective factors affecting the way of registering, i.e. the two tests which designed on the device have a high objectivity, this is what the experts proved about the validity of designing the device to measure the compatibility and the speed of kinetic response for the lower limbs.

Tests of the research

After identifying and rationing the device and the tests that was conducted on it. The two researchers identified the following tests for the main experiment:

- The compatibility test on the manufactured device which had been illustrated in the way of device operation.
- Testing of the speed of responding on the manufactured device that was illustrated in the way of device operation.
- Testing of the kinetic compatibility of the lower limbs in the fencing(31:1).

Goal of the test: To measure the kinetic compatibility of the feet.

The description of the performance

Ten circles are painted on the ground, the diameter of each circle is (10 cm) and the distance between the odd numbered circle and the even numbered circle which would follow the odd circle is (30 cm) and they are numbered from (1-10). The tester stand in front of the painted circles on the ground with an appropriate distance, at the beginning, the feet would be on the guard position. The tester begin to set the feet to jumping quickly on the circles with a compatible position,i.e. the right foot on the odd numbered circles and the left foot on the even numbered circles with a serial and sequential position, forward and backward and the tester is given two attempts and the best one is calculated.

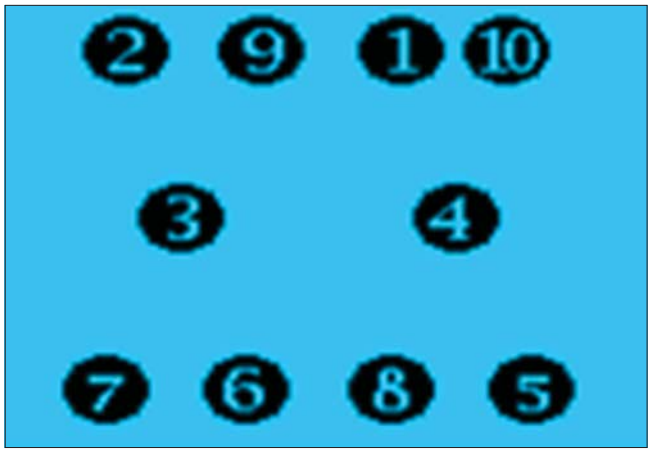

Figure 8: Illustrates drawing the test of muscular compatibility of the feet

The method of registration

The time that the tester takes in the performance of this test is calculated as it is illustrated in the figure (8).

The test of Nelson for the speed of kinetic responding of the lower limbs(3:149)

The goal of the test

It is the ability of responding and moving quickly and accurately in accordance with the choice of exciting.

The description of the test

The test area is painted with three lines, the distance between each line and the other(6.40 m) and length of each line is (1 m).

- The tester stops at the two ends of the halfway line that facing the coach who stands at the other end of the line.
- The tester takes a standby position that the middle line will be between the feet so that her body bends forward slightly.
- The coach hold timer with one hand and lift it up then he moves his arm either to the left or to the right and at the same time he gets the time running.
- The tester respond to the sign of the hand and she tries to run as possible in the specified direction to get to the sideway line that the distance is far from the halfway line with (6.40 m). And when the tester finishes the correct sidline so the coach would stop the timer and if the tester began to run in the wrong direction, the coach would continue in running the timer until the tester changes its direction and gets to the line of the correct side.
- The tester is given (10) consecutive attempts

(20 sec.) between each attempt and the other, five attempts for each side.
- The attempts are chosen in an arbitrary and successive way in each side and to achieve that, ten cardboard pieces (cards) are prepared with unified size and color and it is written on the five of which a word (left) and on the other five cards a word (right), then they are turned upside down in a good manner and are put in a bag and are pulled without seeing them.

The registration

The time of each attempt is calculated, and the passing score is the average of the ten attempts. And the figure (9) illustrates that.

The statistical means

The two testers used the ready- statistical bag (spss) according to the following rules:
- The arithmetic mean.
- The standard of deviation.
- The coefficient of the simple correlation.
- The law of the centigrade ratio.
- The test of the independent samples of (T).

Table 4: The relationship of the correlation of the tests that designed on the manufactured device with other tests to show the efficiency of the device

Tests	Coefficient of correlation	Level of error	Indication
The tests of the kinetic compatibility on the device	0.91	0.000	Moral
The tests of the kinetic responding of the lower limbs			
The test of the speed of kinetic responding on the device	0.89	0.000	Moral
The test of the speed of kinetic responding without device			

Moral at the level of indication ≤0.05

Table 5: The results of the research sample in the tests

The tests	Arithmetic mean	The standard deviation
The test of the kinetic compatibility on the device	4.76	0.53
The test of the kinetic responding of the lower limbs	4.89	0.83
The test of the speed of kinetic responding on the device	3.94	0.62
The test of the speed of kinetic responding without device	4.85	0.71

DISPLAY AND DISCUSSION THE RESULTS

The purpose to show the efficiency and the quality of the designed and manufactured device a test of the compatibility and the speed of responding of the lower limbs had been made on the device to an application sample which (26 students), and a relationship, of these two tests with the test of the compatibility of the lower limbs and (Bass test) to modify the speed of kinetic responding without using the device, had been done. And as its illustrated in the table (4).

It is obvious from the table(4) that there is a high correlation relationship between the compatibility test and the speed of kinetic responding of the lower limbs with the device and without it. This proves that the testers results in the two tests of the compatibility ant the speed responding of the lower limbs are stable, i, e, the device has the high ability of measuring the compatibility and speed of kinetic responding, the researchers attribute that for the non- intervention of the registered or the rectifier in registering the test results gives a high stability and the objectivity of the way of doing the test.

As the manufacturing of the devices and the adoption of modern technology in doing the tests gives high indicators of accuracy and calculating the results are far from the bias and self- errors (38:6).

The sport devices which appeared to the word today according to the scientific and technical concepts which is sophisticated that express the level of the

Figure 9: illustrates The Nelsontest for the kinetic responding.

technology of the modern era, that there is now a huge number of the diverse innovations and inventions which serve the various sport fields and contribute to developing the tests and measurements in the sport training and the kinetic performance (12:5).

The sport coach can take the full advantage of the modern and sophisticated technology in the measuring and testing devices or the other technological devices indirectly in the presses of train in to upgrade the capabilities of the players to the high levels and that through looking forward at all the era developments and to exploit them for develop of cognitive capabilities, so the technology in the field of the sport training in the continuous change (46:2).

Table (5) shows convergence in the results of testing the compatibility and the speed of kinetic responding to the research sample on the device and without it.So the results apparently better on the device from those tests without the device for the absence of the manual registration factor by the registerer and the adoption of the electronic registration by the device. So that gives an accurate and reliable indicator for the validity and the quality of the tests on the manufactured device.(Muktar Salim) adds about disappearing of the traditional suspension watch(Timer)and the ribbon of the end- line of the running competitions in the racetrack,(the line that the runner used to cut by his chest)the contemporary technology exchanged it by an imaginary electronic line so we find on the starting line the referee uses a pistol connected with a special electronic circle with a timer, where it starts to measure the time from the moment that the gas leaves the nozzle of the pistol until the electronic end line in the form of special televising cameras, they have placed in various places and corners that reveal the end line to score (12 pictures) for the runner with the time that is measured with a second and part of the one hundred of the second and identify his arrangement among the rest of the end of the race becomes ready to be read in a time no more than only(10 sec.) from the end of the racetrack.(23:4).

THE CONCLUSION

1. The manufactured electronic device is sensitive and with high accuracy and quality, it is manufactured for the first time in the sport field to measure two capabilities of the lower limbs(kinetic compatibility+ kinetic responding speed).
2. It works in two different ways, the first is to measure the kinetic compatibility and the second is to measure the speed of kinetic responding of the lower limbs.
3. It is prepared a mean of measurementand at the same time a mean for training and for developing of those capacities.
4. The way of its manufacture is simple, inexpensive, fast with available initial materials (spare parts) in the local markets with a high quality.
5. It is easy to carry it and transfer it from one place to another.
6. It is easy of using it by any person.
7. It suits most of the sport events and games.
8. It is appropriate with the different ages and weights. As bears (150 kg) weight.
9. It is easy to work and perform on it and it provides the security and the safety to its users.
10. It is a matter of thrilling and exciting during its use.

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