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The Effectiveness Of Teaching And Evaluation Methods To Solving Mathematical Physical Problems In The Achievement Of Fifth Scientific Students Application.

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Abstract :

The aim of this research is to identify the effectiveness of the methods of solving physical mathematical problems, and the pattern of their testing in the achievement of students of the fifth class application science of physics . The sample consisted of (121) students from the fifth class , who were selected intentionally from the research community . And then divided into nine groups according to the International design (3*3) . Each group studied a specific method of the three methods (the participation, the rotation , and the normal) . The test led to one of three types of tests (opening the book, using abstracts ,and the normal). The experiment was carried out by one of the researchers in the first semester of the academic year (2017 - 2018) and to achieve the aim of the research, the researcher prepared a test of the type of article and consists of six questions , and after the execution of the experiment, and the application of the test and collecting data from the subjects of the sample of the research and analyzed statistically results showed that :

1. There is no statistical significant difference between the average collection of the research groups in physics . And this due to the variable methods of solution, as well as, their interaction with the variable of the pattern of the test .
2. There is a statistical significant difference between the average of achievement of the research groups that performed the last in the style of the open book and the members of the regular pattern groups , and for the open book style groups .
3. There is no statistical significant difference between the average of collection of the research groups that performed the test using the open book types and using of the summaries .
4. There is no statistical difference between the average of collection of the members of the research groups . Which performed the sys thematic use of the summaries and the usual.

فاعلية اساليب حل المسائل الرياضية الفيزيائية ونمط اختبارها في تحصيل طلاب الصف الخامس العلمي(التطبيقي)

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المستخلص :

هدف البحث التعرف على فاعلية اساليب حل المسائل الرياضية الفيزيائية ونمط اختبارها في تحصيل طلاب الصف الخامس العلمي(التطبيقي). وتكونت عينته من(121) طالباً من طلاب الصف الخامس تم اختيارهم قصديا من مجتمع البحث، ثم قسمت الى تسع مجموعات تبعا للتصميم العاملي(3×3) إذ درست كل مجموعة منها أسلوب محدد من الاساليب الثلاث (المشاركة، التناوب، الاعتيادية) وأدت الاختبار بأحد الأنماط الثلاث للاختبار (فتح الكتاب، استخدام الملخصات، الاعتيادي) نفذت تجربة البحث من قبل احد الباحثين في الفصل الأول للعام الدراسي(2017-2018) ولتحقيق هدف البحث اعد الباحث اختباراً تحصيلياً من النوع المقالي إذ تكون من(6) أسئلة ، وبعد تنفيذ التجربة وتطبيق الاختبار وجمع البيانات من إفراد عينة البحث وتحليلها إحصائيا دلت النتائج إلى:

1. لا يوجد فرق ذي دلالة إحصائية بين متوسط تحصيل مجموعات البحث في مادة الفيزياء يعزى إلى متغير أساليب الحل وكذلك تفاعلها مع متغير نمط الاختبار .
2. يوجد فرق ذي دلالة إحصائية بين متوسط تحصيل أفراد مجموعات البحث التي أدت الاختبار بنمط الكتاب المفتوح وإفراد مجموعات النمط الاعتيادي ولصالح مجموعات نمط الكتاب المفتوح .
3. لا يوجد فرق ذي دلالة احصائية بين متوسط تحصيل افراد مجموعات البحث التي ادت الاختبار بنمطي الكتاب المفتوح واستخدام الملخصات .
4. لا يوجد فرق ذي دلالة إحصائية بين متوسط تحصيل أفراد مجموعات البحث التي أدت الاختبار بنمطي استخدام الملخصات والاعتيادي .

Introduction:

Physics is a basic natural science , and its development has contributed effectively in the formation of the inductive scientific method . The teaching of physics with its presentation in correct manner guaranteed that the students achieve the scientific content of this subject, as well as, their scientific methodology and the using of science processes , and this affect in changing the current cognitive structure, and its growth and development , by using elements of the scientific method in the research (59: 1990 . Matar) .

It is well known that the decided physics curriculum to be taught in the secondary stage in general , includes three integrated basic aspects : the theoretical aspect , the solving of physical mathematical issues , the conduct of the practical experiments . And the solution of physics mathematical problems is the basis for evaluating the students understanding of physical laws , as well as ,approval a high levels of Bloom classification ,in the field of application and analysis , if the student exercises the basic and integrated science processes in solving any physical issue .

In this regard , Eayanih (1998) pointed out that if we want to make the student able to solve the mathematical issues in a good way ,we must take in consideration the cognitive and emotional characteristics for him of his success , and failure in solving methods of issues , not depends only on the amount of his knowledge of content and laws , but there are emotional factors the student feels with it ,during the work of skills of solution such as anxiety and enjoyment and frustration and therefore positive perceptions which connected to the ability to solving the methods of issues increases his motivation and ability of solving mathematical issues (10:1998 . Eayanih) .

Because of the importance of methods of solving mathematical issues, we find that those which were teaching the science emphasize the need or necessity to include the curriculum this component , and training students directly or indirectly on strategies to solving mathematical issues during the lessons , (MTCN) that emphasized that the educational programs must enable all students

of the standards of solving the methods of issues as building new knowledge through solving the problems , and , using and adapting many appropriate strategies, and observing the process of solving and contemplating mathematical methods (355 : 2008 zoghbi) .

On the other hand, many researchers and men of education pointed out that the importance of strategies for solving physical mathematical problems ,because they help students to acquire physical concepts when solving problems ,and they also make teaching full of meaning , as well as developing the skills of solution, scientific thinking , curiosity . Scientific inquiry and the ability to apply laws and physical principles in new situations (107:2003 . salaam) (Arsan , abo Zena ,2005:64).

By taking an objective look at the reality of teaching physical mathematical issues within the prescribed curriculums. Teachers are most interested in solving certain specific issues in the systematic book, and the book itself by reading and solving the problem modes without giving students sufficient opportunity to thinking about solving problems while Abu Zeina (1986) mentioned that giving students an opportunity to think about ways to solving problems alone and understand them and proposing plan of the solution and discuss it collectively by a teacher and this is a vital thing in teaching solving of mathematical problems to develop their ability in methods of solving issues, as well as, encouraging them and suggesting of another ways to solving's a specific issue and then investigate the validity of the solution (ab. Zane , 139 : 1986) .

In this regard both tamim and Batul (2008) pointed out that the majority of students in all stages of education find it is difficult to understand physical concepts and apply them, when, solving physical mathematical problems and to find the proper interpretation for many natural phenomena . This is due to the expansion of physical knowledge and its ramifications and their concepts to high abstraction levels , and this leading to the formation of concepts with miss conceptions of a number of them , and give attention to the development of skills of solving mathematical issues in the physical subject have been addressed

by several foreign studies . Arabian and local Through the adoption of modern strategies in solving mathematical problems including physical : alwani study (1995). Al-saied ((1997) , omri (2002) , khaji (2002) , al-malk (2007) . Gamze (2008). tolga (2008) , al-swedi(2010) .These studies have reached in positive results in the collection of samples members, as well as , developing of skills in the methods of solving issues.

Through the experience of the researcher in the field of teaching physical both at the level of university education and secondary education period of applications and noticing , and he refers to that students in the fifth grade of science are facing great difficulty in absorbing the material, as well as , solving mathematical issues. Which is make a barrier to them in the application of laws and physical principals to reaching to proving a physical facts or confirmation of a particular concept .

The researcher benefited from the opinions of some educational specialists of physics and a number of male teachers, and female teachers of this subject on this phenomenon and the level of prevalence among the fifth grade scientific students have confirmed it, and it constitute a major problem for them, and the researcher is specialized in the methods of teaching physics , and he follow- up Program of scientific education or seminars at the college education and field experience in teaching physics for the fifth grade scientific ,and attempt to developing a proposed solution to this negative phenomenon, in our schools through the adoption of strategies and methods to solving physical mathematical issues, on the one hand, and the adoption of patterns of testing, on the other, may contribute in solving it and raise of the level of students achievement, thus it can be determine the problem of the research by asking the following:

What is the effectiveness of teaching and evaluation methods to solving mathematical problems in the physical achievement of students in the scientific fifth class?

Importance of The research :

The importance of research lies in the following aspects:

1. An attempt to developing an educational solution to the problem

of low achievement of students in the fifth class in physics, and raise their scientific level .

2. Adapting two independent variables (methods of solving problems , and test pattern) and their interaction in improving the level of students in fifth class of physics.
3. After a launch of other researchers and graduate students in the adoption of international design in the treatment of dependent variables .
4. Providing teaching methods in the college of education , and the teachers of physics for the preparatory stage on the proposed strategies , and patterns of methods of solving mathematical physical issues.

Aim of the research:

The aim of the research is to identify the effectiveness of teaching methods ,and three evaluation patterns , and their interaction to solving physical mathematical problems in the achievement of students of the scientific fifth class for subject of physics.

Hypotheses of the research:

1 - There is a statistical significant difference between the average collection of research groups in physics according to the variable methods of solving physical mathematical issues .

2 - There is no statistical significant difference between the average collection of research groups in physics according to the test pattern variable .

3 - There is no statistical significant difference between the average collection of research groups in physics according to the variables solution methods and the test pattern.

imits of the research :

Identify current research as :

1. The students of scientific fifth grade in the secondary school in the city of Mosul for the academic year (2017-2018) .
2. Chapter three (powers) of the book of physics for students of fifth grade Scientific .

Identification of the terms:

The Strategy Identify by :

Abu jado (2000) : it is a group of rules and steps that contain within each of them many activities and techniques that help the individual to achieve his mission (476:2000, Jado) .

Obaid (2007) : is a group of actions and movements to reach to the limited aim to convince or push the students to learn and achieve the aims of lesson (140 : 2007 Obaid) .

Grewan (2002): is an intellectual process, which an individual uses his previously acquired knowledge , and skills for respond to the requirements of unfamiliar situation to him (95:2002,Grewan) .

nuahiduh 2003: the process or operations carried out by the student using the information or skills that he has already learned or acquired to overcome a difficult situation unfamiliar for him in the past.

Al - Zaghloul and Emad (2003) : is an intellectual work through which the stock of information rules , skills and previous experience to a certain end .

Methods of solving the issues:

From the previous two definitions, the researcher wished to formulating three procedural definitions for strategy of solving issues so as following :

Strategy of the participation :

A group of organized steps which performed by the physics teacher during the solving of a physical issue that involves the participation of a number of students in some steps of solution to reaching to the final output.

Strategy of the rotation:

A group of organized steps performed by the physics teacher during the solving of physical issues with some of his students alternatively ,him or his students separately, until the end result .

Strategy of the normal:

Is a set of organized steps that performed by a physics teacher during solving a physical issue without participation or rotation in the solution with his students , and investigation the final result.

Pattern of the evaluation :

The researcher considered the definition of the (pattern of evaluation) procedurally as follows:

Pattern of the open book :

Is the pattern of evaluation which the teacher of physics allows for students of the scientific fifth class(application branch) using only the decided methodological book during the answer of the tests' paragraphs for purposes of the current research.

Pattern of using the summaries

Is the pattern of evaluation which the teacher of physics allows for students of the scientific fifth class(application branch) using only the summaries ,and school notebook during the answer of tests' paragraphs for purposes of the current research.

Pattern of the normal test

Is the pattern of evaluation which practiced by the teacher of physics with his students of scientific fifth class during the examinations without depending on any help in answer of the tests' paragraphs for purposes of the current research.

The previous studies

The researcher saw many previous studies that interested in studying the strategies and methods of solving physical mathematical issues in physics subjects.

1/ Study of the Al-Alwany (1995):

This study was conducted in Iraq and aims to know the effect of using the organizational and deductive method for solving the issues of physics in the achievement of students in the scientific fifth class. This sample consisted of (120)male and female students ,and divided into two equal groups (experimental and controller) . The tool of the study represented by achievement test , after the implementation of the experiment of the study and analyzing the data statistically, the study reached to a number of results :-

1 - There is statistical significant difference between the average achievement of the students of the two groups (experimental and controller) for the benefit of the experimental group.

2 - There is no statistical significant difference between the average achievement of the students of the experimental group.

2/ Study of saed(1997) :

This study was conducted in Egypt, and it aims to know the effectiveness of teaching issues of the physics in a proposed strategy in developing the skills of students in the secondary first class to solving the issues and the achievement of concepts , and give them directions towards solution of those issues .The sample consisted of (68) students , and divided into two equal groups (experimental and controller) ,and the tools of research represented by collectible test of concepts, and the other for

skills of solving the issues ,and the third measurement of the direction towards physical issues. After the implementation of the experiment of the study and analyzing data statistically , the study reached to the following results:

1. There is no statistical significant difference between the average achievement of concepts and solving physical issues for the two groups (experimental and controller) for the benefit of the experimental group.
2. There is no statistical significant difference between the average gain direction toward solving physical issues in the experimental and controller groups.

3/ Study of Al-Mumari(2002):

This study was conducted in Iraq, and it aims to know the effectiveness of using a proposed strategy in the light of the style of the systems in developing skills of the secondary second class in physical issues , and developing their tendency towards subject of physics. The sample consisted of (30) female students divided into two equal groups (experimental and controller). and it depends on two tools, the first is a test of skills of solving the issues, and the second is a scale of the tendency towards physics , and after the implementation of the experiment of the study ,and analyzing data statistically , the results showed that :

1- There is a statistical significant difference between the average of development of skill of solving the physical issues between the two groups (experimental and controller) for the benefit of the experimental group.

2- There is a statistical significant difference between average of development of tendency towards physical issues , between the two groups (experimental and controller) for the benefit of the experimental group.

4/ Study of Khaji (2002):

This study was conducted in Iraq, and it aims to know the effect of Paulia strategy in the development of skills to solving the physical issues for the students in the general fourth class. It's sample was consisted of (53) students, divided into two equal groups (experimental and controller),and its' tool was represented by a test of skills of solving the physical issues, after implementation of the experiment

of the study analyzing the data statistically, the results showed that:

1- There is statistical significant difference between the average of developing skills of solving the physical issues for the two groups (experimental and controller) for the benefit of the experimental group.

5/ Study of Al-malik (2007) :

This study was conducted in Saudi and aimed to know, the effect of a proposed strategy of teaching in processing the difficulties of solving the physical issues of the secondary first class of female students ,it's sample consisted of (132) female students, divided into two equal groups(experimental and controller) its' tool represented by a test of skills of solving the physical issues, after the implementation of experiment of the study and analyzing the data statistically , the results showed:

1- There is a statistical significant difference between the average skills of solving the physical issues of the two groups(experimental and controller) for the benefit of the experimental group.

6/ Study of Gamze(2008):

This study was conducted in turkey, and aimed to know the effect of training on strategy of solving problems in the achievement of first class students physics department, and their performance to solving the issues ,and its, sample consisted of (74)male and female students, divided into two equal groups(experimental and controller) its' tool was a test of achievement after the implementation of the experiment of the study and analyzing the data statistically the results showed:

1. There is a statistical significant difference between the average of achievement of two groups (experimental and controller) and for the benefit of the experimental groups.
2. There is a statistical significant difference between the average of the performance of the two groups(experimental and controller)and for the benefit of the experimental group.

7/ Study of Tolga (2008):

This study was conducted in Turkey, and aimed to know the effect of using a strategy of the cooperative learning to solving physical

issues, and its' sample consisted of (46) students of the secondary second class , and divided into two equal groups (experimental and controller) , The researcher adopted the achievement test as a tool for study, after the implementation of the experiment of the study, and analyzing the data statistically the results showed:

1- There is a statistical significant difference between the average of the performance of the two groups (experimental and controller) and for the benefit of the experimental group.

8/ Study of Al_Suede (2010)

This study was conducted in the Iraq, and aimed to know the effect of two strategies of Paula and Al-Smadi, and the methods of solving physical issues in the achievement of female students of the scientific fifth class ,and the development of their motivation toward learning physics, and the sample consisted of (92) female students , and divided into three equal groups ,the researcher adopted a two tools , the first is a choice of achievement , and the second a measurement of motivation toward learning physics , after the implementation of the experiment of the study, and analyzing the data statistically the results showed:

1 - There is on statistical significant difference between the average of achievement of the two experimental groups, the first and the second, and the two groups the first and controller ,and for the benefit of experimental group in subject of physics.

2 - There is a statistical significant difference between the average of achievement of the two groups ,the second experimental group, and the controller , and for the benefit of the experimental group in physics.

Indicators and significance from the previous studies.

After review the previous studies, the researcher conducted the following inductors :

All of the previous studies aim to know the effectiveness of strategies and methods of solving issues in physics in dependent variables, such as achievement, skills of solving issues, direction and tendency towards learning physics.

It's also included two equal groups (experimental and controller)

either the educational level was mostly in secondary school level (fourth and fifth) except study of Gamze (2008) at the university level .It is also noted that all studies adopted one independent variable which is a strategy of solving physical issues in several levels .But the current research is adopted factorial design (3*3) through adopting two independent variables (strategy of solution, pattern of the test) and by three levels for of each, and that will applied in physics as well with students of scientific fifth class , and contains nine groups depending on his two independent variables , and it will discuss the interaction between the two independent variables in their effect on the dependent variables.

Procedures of the research :

For implementation of the experiment of the research, the researcher choice the experimental design, and its sample , as well as , its tool and suitable statistical means so as follows :

Firstly: The experimental design :

In order to achieve the aim of the research, and select its' hypothesis, the researcher adopted the experimental factorial binary design of the (3*3) by adopting two variables, the first is the strategy of methods of solving physical mathematical issues, This variable is divided into three levels, the second variable is the pattern of the test , and also distributed on three levels, as shown in the figure below:

Factorial experimental design (3*3)

Pattern / The test / Strategy of solution	Open book	Use summaries	The normal
Participation of Students in some steps of solving issues	M 1	M 2	M 3
Rotation between the teacher and his students in solving issues	M4	M5	M6
the teacher solving the issues alone	M 7	M 8	M 9

As it is clear from the design that it contain nine groups of teaching , each of three of them in one section of study , and according to a specific teaching strategy within the methods of solving mathematical physical issues, and distributing during the period of the post-test to three patterns only for test .

secondly: Selection a sample of the research :

After determining the community of the research from the students of the scientific fifth class in secondary schools in the city of Mosul for the year (2018-2017), and viewing the number of sections for the scientific fifth class (application) the researcher chose preparatory of abd ualrhman AL-ghafqi intentionally because it contains three academic divisions for the scientific fifth class (application) , as well as , the researcher is a teacher of physics . The sample consisted of (121) students divided into three study groups (A ,B ,c) respectively, and from the successful students for that year , after the exclusion of the repeaters , students of each division will study by specific strategy in solving physical mathematical issues , and then each group show three patterns of post-tests .after that the researcher distributed the sections of study randomly on strategies of the solving issues as shown in the table (1) in this table members of the sample of the research distributed in the classes according to the two variables of strategy of the solution, and the pattern of the test .

Section	Pattern of the test / Strategy of the solution	Open book	using summaries	Normal	total
A	Participation of the Students in some steps of solving the issues	11	10	12	33
B	Rotation between the teacher and his students in solving issues	13	17	16	46
C	The teacher solves the issues alone	16	15	11	42
	Total	40	42	39	121

thirdly : Tool of the research:

In order to verify the level of collection of the sample of the research for the subject of physics ,this requires a tool through which it can be measured, the researcher like to adopt the test of a achievement for this purpose with the same arithmetic style , because this type of tests gives the students a chance to practice the skills of methods of solving physical mathematical issues, as well as, avoiding the guessing, and adopting the Bloom's levels of classification for the cognitive field in levels of comprehension , application, and analysis, so the researcher analyzed chapter three (the force , the torques , the friction) and adopting the levels of (comprehension , application , and analysis) from Bloom's classification of the cognitive field, six paragraphs were prepared two of them for each level (Appendix 1)

In order to investigate the truth of the content of the test, it was submitted with a list of behavioral purposes ,and the decided methodological book to a strict committee , which its' members have the experience and specialization in the field of teaching science , measurement , and evaluation , as well as, number of teachers of the physics in the preparatory stage .The researcher took a ratio of agreement (% 80)and more as a standard to accept the paragraph or not, and the six paragraphs have obtained this percentage, and more , so , verifying the validity of the test have been achieved (Al-Nabhan 2004:253)

In addition to that the investigation of simplicity and stability of the paragraphs of test (Midterm retail) by applying it on a sample survey consists of (42) students from the fifth class (application) in the central preparatory school, after analyzing their answers on a paragraphs of the test.The ease of the test paragraphs was (0.55 , 0.51 , 0.43 , 0.4 , 0.59 , 0.65) Respectively , and by applying the equation of Pearsons' correction to the two half of the test, the stability ratio (0.71) , and corrected by Spearman Brown which reached to (0.83) which is an acceptable percentage for unconvincing a achievement tests , Thus, the test became ready to be applied in a final form to the members of the

basic sample of the research.

Fourthly: Execution of experiment of the research :

After testing the sample of the research and distributing it randomly on the research groups, and excluding the repeater students from it , as well as, the adoption of criteria of the school in distributing the students equally on the studying sections according to their general rates in the fourth class which gave a vision to the researcher that there is a measure of parity between them , the experiment was carried out by the researcher for the three sections in the first semester (2017/11/2) and in two stages :

First stage : Strategies of solution : In this stage executing the strategies of methods of solving of the mathematical physical issues for groups of the research so as follows :

A- Strategy of the participation:

1. The teacher reads the questions ,and give full details for the data and the demands on the board.
2. The teacher explains the strategy and steps of solving the physical question by method of participation.
3. After that , he executes some steps of solving .
4. The teacher Stops from completing steps of the solving , and give a chance for many of the students for completing the solving of the question.

The teacher Repeats the process with the other questions .

B - Strategy of the rotation :

1 - The teacher reads the questions , and separates the data and the demands on the board .

2 - The teacher explain the strategy and steps of solving of the question by method of the rotation .

3 - After that , the teacher start executing steps of complete solving the question to its' end.

4 - Repeating the preview step by one of the students on the board in solving the question completely to the end , and helping the student , when he stumbling .

5 - The process was Repeated with the other questions .

C - Strategy of the normal :

1. The teacher reads the question and separates the data and the demands on the board .
2. The teacher explains the strat-

egy and steps of the solving of the question on the board by himself , and the questions and inquiries were delayed to the end of the solution .

3. After that, the teacher starts executing the steps of the solving of the question completely to the end.
4. After the end of the solving of the question, the teacher give a chance to the students for asking about the steps of solution .
5. The process was repeated with the other questions .

Second stage: Patterns of the solution :

This stage come at the end of executing of the experiment by strategies of methods of solving the physical mathematical issues , and when procedure the post -acquisition test (2018/1/25)for executing the pattern of test so as follows :

1 - Dividing the members of the study divisions to three categories (1m , 4 m , 7 m) (2 m , 5 m , 8 m) (3 m , 6 m , 9 m) .

2 - Applying the pattern of the test on each group from categories of the three strategies of solving in a class of study, as follows:

A- Pattern of the open book : It is allowed for members of these categories (1m , 4 m , 7 m) opening only the decided methodological book when answering the paragraphs of the test.

B- Pattern of using the summaries : It is Allowed for members of these categories (8 m ,5 m ,2 m) using ,only the notebook and summaries without the book, when answering the paragraphs of the test.

C- Pattern of the Normal : This pattern executing by the normal way in the parts of the tests , without using any assistant way for the answer .

3. Apply uniform instructions with the three categories from the side of time of the test , and not allowing for observers to present any feedback, or allowing for students to talking to each other , or asking for the help .

fourth : Correct of the tool of the research :

In order, to give the quantitative status for response of the members of sample of the research on paragraphs of the achievement test , so the researcher has prepared a typical answer for his

paragraphs , and the scores of the test are (0 - 100) .

Fifth: statistical means:

1. Test of analysis of the factorial contrast of two - ways .
2. Shifie's test for dimensional comparisons .
3. Coefficient of the correlation of Person .
4. Coefficient of the correction of Spearman brown .

Viewing and discussing results of the research :

In the light of aim of the research , and its three main hypothesis, the researcher extracted the arithmetic average , and the standard deviation of collect members of groups of the research in physics according to variables of strategy methods of solving the issues , and the style of selection , and display it in a table (2)

Table (2)

The arithmetic average, and the standard deviation to collect members groups of the research in physics , according to variables of strategy of methods of solving the issues , and the style of selection.

Strategy of methods of solving mathematical physical problems	Data	Pattern of the test			Total
		Open book	Using summery	The Normal	
1st : students participate in some steps of the solution	N	12	10	11	33
	X	57.166	52.700	43.0909	51.1212
	S	7.767	10.530	16.440	
2nd: The rotation between the teacher and his students in some steps of solving the issues	N	12	17	17	46
	X	55.500	48.3529	50.5294	51.0217
	S	14.884	11.526	9.881	
3rd: the normal methods of solving the issues , only the teacher	N	16	15	11	42
	X	55.250	50.7333	41.5455	50.0476
	S	11.924	10.409	6.772	
Total		40	42	39	121
		55.900	50.2381	45.897	

And for verifying the three main hypothesizes of the research , the researcher applied the test of analysis the factorial contrast which have two directions at the two variables of the test, by using the statistical bag (spss) ,and the results are putdown in the table (3) .

Table (3)

Results of analysis of the test of the factorial contrast in variables of strategy of the solution , and the pattern of the test , and the interaction between them to collect groups of the research in physics.

Source of the variance	Degree of the freedom	Total the squares	Average of total squares	F		Significance
				The Tabled	The Calculated	
Variable of strategy of the solution	2	120.604	60.264	0.472	3.0822	0.631
Variable of Pattern of the test	2	2282.193	1141.586	**8.758	3.0822	0.000
The Solution Of X test	4	709.250	178.212	1.360	2.4576	0.253
The error	112	14608.454	131.343			
The corrected Total	120	17410.876				

After viewing the results in table (3) the researcher will adopt it according to the main hypothesizes ,so as follows :

first : The related results with the first main hypothesis, which its' text: "There is no statistical significant difference between the average collection of groups of the research in physics depending on the variable of strategy of methods of solution of the issues" .

The table shows that the calculated fancy value reached to (0.462) and it's less than the fancy schedule value (3.0822) in the level (1)(0.05) , and a degree of freedom (2-112) , and this means that there is no significant difference between collection of the groups at this variable .Thus , that forming this main hypothesis, and its three branches , and this result was agreed with the results of study of each : AL- alwany (1995) , Al-seed (1967) , Al - Suede (2010), and the researcher attributes this result to : convergence of averages of collection of members of groups of the research at variable of strategy of methods of solving the three physical issues , and although the variance between mechanism of implementation of each strategy for methods of solving issues , and the role of both of the teacher of physics, and his students. But there are reasons that can be taken into the consideration , and it's :

1- Subject of physics is a difficult subject relative to a comprehension of students of the scientific fifth class (application) , because it contains abstract physical concepts , which demand a mental and mathematical imagination for taking on solving the physical issues .

2- Generally , students and through the view of most previous studies , which dealt with the teaching of physics , they may have a negative direction of this subject , because of the difficulty of solving its' questions and mathematical issues , because it raise their level of thinking to the levels of application , analysis and structure .

3- There is a negative phenomenon for the most of students of secondary school, it's the dependent on the saving and demonstration of subjects of physics , and focusing on the short summaries in the definitions without return to the book in understanding the sub-

ject correctly, as well as, they are saving the steps of solving issues , and solved examples in the book , without the practicing and training on the skills of methods of solving the physics issues and this appearing to clear in the presentation of any external question for them .

4- Majority of the students in the scientific fifth class (application) have conviction that the base is the scientific sixth class (application) , and they have override this class by the lowest marks , so their level have been noticed in the table (2) almost(%50) .

Second:-The related results with the second main hypothesis, and its' text : "There is no statistical significant difference between the average of groups of the research in physics according to the variable of the pattern of the test".

The table shows that the calculated fancy value was reached to (8.758),and it is more than the schedule fancy value (3.0822) at a level of significance (0.05) , and a degree of freedom (2 -112) ,and this means that there is a statistical significant difference between the average achievement of the members of groups of the research ,and this attribute to variable of pattern of the test. Thus, rejecting this main hypothesis.

As it known , the analysis of contrast does not specify the direction of the difference between the groups when it appears , and this requires the adoption of another test to detect the moral difference between the groups, so the researcher adopted test of (shifie) for the dimensional comparisons and the results are put dawn in a table (4) .

Table (4)

Results of test of Shifie for dimensional comparisons, between average of achievement of a groups of the research in subject of the physics , which due to the variable of a pattern of methods of solving of the issues.(*)

Pattern of the Test , and arithmetical average 55.900		Using Open book (40)	Using the summary (42)	Usin g the normal (39)
		50.238	45.897	
Open book (40)	55.900	---	5.039	*15.1529
Using summa-ry(42)	50.238	---	---	2.9238
Using the normal (39)	45.897	---	---	---

Critical (6.1644) , and this means that there is no statistical significant difference between average of the two patterns of a test of two groups , thus the first sub -hypothesis is decrease at this variable, so the table shows the same status , when comparing between the two patterns of the test , using the summary (notebook) , and the normal pattern , where the calculated shifie's value reached to (2.9238) , and it's more than the critical shifie's value (6.1644) this means that there is no statistical significant difference between the average of two patterns of the test . And so, the second sub-hypothesis was accepted at this variable.

But, the calculated shifie's value , between the two average of the two patterns of the tests , open book and the normal has reached to (15.1592) ,and it's more than critical shifie's value (6.1644) , and this means that there is a differ-

(*) Statistical function

It is clear from the table that the calculated value of chivi , reached when compared with the average of the group of members who benefited from the methods of solving issues by the pattern of open book, and the of members who benefited from the methods of solving issues by the pattern of test and using files (copybook) and it less than the value of chivi

ence between the two averages , and for benefit of pattern of test of the open book , so this third sub -hypothesis will be refused, and the alternative accepted , the researcher attributes these results by this order : the pattern of open book have helped the students to overcome the tests' anxiety , and gave them a suitable opportunity to research and analyze , and harnessing the ability of memorizing and remembering to ability of understanding, application , and analysis , as well as, acquire them skills of methods of solving physical issues .

As noted from the table (4) that the collection level of groups of open book is better than the collection level of the other two patterns (the summary , the normal) , as noted that the level of pattern of using the summaries didn't reach the required level , because this summaries doesn't give the students a large area of comprehension , and application , but it's specific in solving some issues, and writing the definition ,whereas , the pattern of the normal , always encouraging the students to save and memorization , and when he subjected to external issue , or an unusual analysis he becomes unable to do so ,with great regret , our students were accustomed to remember the application , viz , preservation of issues , and the ready solutions from the book and summaries.

third : The related results with the third hypothesis , and it's text :

"there is no significant difference between average collection of groups of the research in subject of physics for interaction of the two variables of strategy of the solution , and the pattern of the test " .

It's clear from the table (1) that the calculated fancy value reached to (1.360) , and it's less than the schedule fancy value (2.4576) at a level of significant (0.05) , and a freedom degree (4 -112) ,and this means that there is no statistical significant difference between the average collection of groups of the research in subject of physics this attributed to interaction of two variables of strategy of methods of solving issues , and the pattern of the test , so , this hypothesis is accepted , and the alternative is refused .

The researcher attributes these results to variable of strategy of methods of solving issues , which its' effect was convergent in the groups of the research in the collection, were as ,the pattern of the test had a clear effect on it , as shown in the table (2), So , this was reflected on the interaction of these two variables , but although there was no moral difference for interaction , but it's clear from the table (2) the best collection was at the first group which studied by the share strategy , and pattern of open book , were as , the less collection in the ninth group which studied methods of solving mathematical physical issues by strategy of the normal , and pattern of the normal test , and this gives an indication to that the two variables have an impact in raising the level of achievement of the students.

Conclusions :

In light of the results of the research the researcher draw the following conclusions:

1- Weakness in level of ability of students of the scientific fifth class (application) in the skills of methods of solving physical issues .
2- Strategies of methods of solving the physical issues are closely in effecting in achievement of the scientific fifth class (application).
3- Pattern of the test , which depends on open book have an effect in achievement of students of the scientific fifth class (application) balancing with the two patterns of methods of solving the issues , by using summaries , and the normal .

Recommendations:

1- Training male teachers , and female teachers of the physics for the middle school on strategies of methods of solving the physical issues , and patterns of the test.
2- Training students of the scientific fifth class (application) on skills of methods of solving the physical issues.
3- Including the vocabularies of teaching methods , and practical education in the colleges of education (strategies of methods of solving issues , and patterns of the tests).

Suggestions:

Completing the current research, the researcher suggests conducting the flowing future studies :

1- Comparing two strategies of teaching in ace question students of the scientific fifth class (application) skill of methods of solving mathematical physical issues.

2- Effectiveness of three pattern of test in achievement of the scientific fourth class for the subject of physics , and reduce the anxiety of the test for them.

3- Effectiveness of the two variables of strategy of methods of solving mathematical physical issues , and its pattern of solving in comprehension of the students of the first class in college of education / physics department , and developing their direction towards physics.

References :

- Abu Zena , Fared Kamel (1986) The common strategies of teaching for teacher of mathematics in the middle school, the magazine of the Yarmouk researches the series of human and social sciences, folder (2) number (2) , page (119-141).
- Jaroan , Fathi abdulrahman (2002) Teaching of the thinking (concepts , and applications) , dar alfikr for printing and puplishing , Amman , Jordan .
- khaji, Thane (2004) Effect of using strategy of Polia in developing the skills of physical issues, Alfath magazine, number (20) , university of diala, page (125-141).
- Al-Zoghbi , Ali Mohammed Ali (2008) monitoring some skills of thinking , beyond the used knowledge by teachers of mathematics , and their students in the upper basic stage in Jordan during solving of the gumetrical issues , magazine of University of Damascus, folder (24) number (2) , page (330-345).
- Al-Zagholo, Rafea Al-Nadeer and Emad Abdulrahim Al-Zaghlol

(2003) the knowledge psychology , Dar-Alshorouq for publishing and distributing , Amman , Jordan.

- Salama , Abdul Hafez (2003) methods of teaching science and mathematics , first copy , dar Al-yazoury , the scientific for printing and publishing , Amman, Jordan.
- Al-saed , Mohammed Ali (1997) Proposed strategy in the light of method systems for teaching issues of physics for the secondary first class, magazine of college of education of the science, University of almansoura, number (34) , page (95-138) .
- Al-Suede , Ali Salem (2010) Effect of the two strategies of Polia, and Al-Sahara for solving the physical issues in the achievement of students of scientific fifth class , and developing of two motivations of teaching physics, University of Mosul , college of education of the science (published master thesis)
- Alani, Basma Mohammed (1996) Effect of using two methods for solving methods of chemistry issues in achievement of female students of general fourth class in middle school , University of Baghdad , college of education , Ibn-alhaitham (unpublished master thesis) .
- Obaid , Walim (2007) Teaching mathematics for all children in light of the requirements of criteria , and culture of thinking, Dar-Almansira for publishing and distributing, first copy , Amman, Jordan .
- Arsan , Hasan Mohammed and Fareed kamal Abo Zeana (2005) Effect of practical program for strategies of solving methods of mathematical issues in developing the ability in solving mathematical issues, and achievement in mathematics for students of basic stage in Jordan, Magazine of Muata for researches and studies , folder (20) , number (7) , page (61-83) .
- Al-alwani , Mohannad Sami (1995) Effect of using organizational -deductive method in solving physical issues in achievement of students of scientific fifth class, University of Baghdad, college of education of the science, Ibn Al-Haitham (unpublished master thesis) .
- Al malek , Fatima (2007) Effec-

tiveness of proposed strategy for solving difficulties of physical issues for female students of the secondary first class in Alryadh city, University of um alqura , college of education of science (unpublished doctorate thesis).

- Al_nbahan , Musa (2004) ,Fundamentals of measurement in behavioral sciences , first copy, Dar_alshorouq for publishing and distributing , Amman, Jordan .
- Nuahida , Mohammad (2003) Effect of practicing of students of the basic tenth class in the governmental schools in Jenen Governorate on strategies of solving methods of mathematical issues on academic achievement , and keep their information, and their connection in achievement motive , University of national Alnagah, college of higher studies (unpublished university thesis) .
- Game ,S:Erol, M .(2008) The effect of problem solving instructional on physics achievement, problem solving performance and strategy use , journal of theory and practice in education, vol(2) no(3) , p p . (151_166).
- httpll: we. Journal . lapen . Org. Mx.
- Tolga . C . Silay , I .(2008) effect of problem _solving strategies teaching on the problem _solving attitudes of cooperative learning groups in physics education journal of theory and practice in education. Vol (u) , no(2) pp. (253_266).