

## **The Comparative Study of Active Cooperative and Problem Solving Methods with Prevalent Method in Schools Regarding Creativity Training on Subject of Physics Student**

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### **Abstract**

The present study aims to perform a comparative study between two methods of active problem solving and cooperative with prevalent methods regarding physics creativity training on subject of female junior students of Zahedan schools.

The research hypothesizes are:

- 1- There is a significant difference between recruiting of problem solving teaching method in physics and common method on subject of appearing creativity in female junior students of high school.
- 2- There is a significant difference between recruiting of cooperative teaching method in field of physics and traditional one regarding flourishing of creativity in female junior students of high school.
- 3- There is a significant difference between recruiting of problem solving teaching method in physics and common method on subject of appearing creativity in female junior students of high school.

In this study, the semi-empirical for 179 students is recruited, besides cluster sampling is applied. Then the creativity test is designed by expertise on subject of physics creativity and after reforming, reviewing, reliability and stability assessment of tools; the mentioned test is recruited as a pretest and posttest.

Based on achieved results, two methods of cooperative and problem solving comparing to prevalent methods are more effective considering creativity training on students of physics.

**KEYWORDS:** Active teaching method, problem solving method, cooperative teaching method, creativity, the ways of creativity flourishing, student creativity, the elements of creative thought test

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### **Introduction**

Those procedures will bring creativity with students which are active. It means those procedures are agreeable which fore student to active participation while teacher is not more than a moderator who facilitate learning process. Gilford proclaims creativity depends on a collection of individual specifics and skills. He believe the creativity should not be searched only on subject of invention but creativity is a potential intellectual property which people with different ages have various grades of it.

Strenberg define creativity as recruiting of intellectual property to produce an idea or thought.

Gislin interoperate creativity as the ability of finding new associations besides producing of nontraditional thoughts(Aghazadeh,2003).Tornes believes the most effective methods regarding creative education are those methods which consider cognitive and emotional aspects simultaneously to motivate and generate active learning opportunities, obviously regarding to globalization process, modern perspective is differ from dominant traditional one(Afzal-ol Sadat,2006).

To help with basic education, one of the tasks of higher education reform is to

Develop students' innovative ability in each basic course and in specialised

Fundamental courses (Zhang,2006) . This is especially important in developing research

And innovative practice by undergraduate students in early years of study, since it is necessary to cultivate competitiveness among college students (Zhang,2007;Lu,2011) . Ministry of Education must help to its learners on subject of self-training promotion by creativity – quick decision ability- educative habits and self-consciousness(Keramati,2003).

Reis believes tocoach roll as a pattern and advisor in creativity development and expresses the teachers must be well skilled on their courses content, being aware of various teaching methods while recruiting them in their teaching process (Hassian,2001).

The performed studies in field of creativity shows creativity can be taught too(Amabile,2007).

Curriculum must be arrange in a way which connects various experiences. The teaching process is programed in different forms in respects of place, objectives, contents and target audiences. However there is a basic and unified structure for teaching that forms to learning experiences (Aghazadeh,2003). Creativity needs to time for development and fulfillment of experiences(Strenbe,1989).

Professional growth of teacher is the prerequisite of recruiting cooperation oriented learning method. The teacher will reach to a professional growth in recruiting of this method if he is aware of its related theoretical and philosophical principles, knowing cooperative methods of learning and he enjoys supporting of collogues and parents (Keramati,2003;Strenbe,1989).

Therefore to train creative and pioneer children in education system, the effective factors must be identified while programing for those solutions which resulting to increasing and development of creative insight. The teacher is the most important elements which has a close relationship to student and training of his properties.

Recruiting of creative methods by teachers naturally results to formidable, creative students who enjoy new thoughts. The students who apply above mentioned skills wisely in front of life, solving human society problems. The humans who does not affaire of

encountering with problems, following new and different ways for assessing subjects, consider on the most possible effective solutions and finally donate a new formation and sprits to world.

In this study, the researcher assess the impact of two active cooperative method and solving problem method on training creativity on subject of physics in juniors student of high Scholl level. There is a lot of performed related studies which are:

The group discussion group and exploratory teaching methods are effective in training of student creativity besides solving problem method leads to flourishing of creativity in student of fifth level(Emrani,1998).

The cooperative teaching method has been effective on training of creativity in elementary students while the brainstorm method is more effective than problem solving method regarding creativity training(Hassani,2001).

The active methods of teaching (cooperative, multiple intelligence and brainstorm) are more effective than traditional and common ones regarding student achievement(Saljouqi,2002).

### **The method**

The present study is classified in semi- empirical group considering its specifics and characteristics. The first grade of high school and physics class primary selected. Than the plan, cooperative teaching and problem solving methods are taught to teachers. They are ordered to apply these methods for 3 months. Finally, the researcher classified the results in two groups of cooperative and solving problem regarding, besides these results are analyzed and compared regarding creativity in two pre and posttests level.

### **Sample and measurement method**

The sample volume includes of 179 female students. Cluster sampling is recruited to this study. The control group includes physics class in Ghods high school for girls.

### **Measuring tools**

The fundamental basis of this study is researcher made survey, considering the lack of any related standard test, a test on subject of creativity in physics is designed which resulted of occupation between Wisdom Association and researcher. Than this test is assessed and reviewed by teachers and well informed individuals regarding creativity in physics. It must be reminded that the following scales are recruited to correct the test which is performed by plan teachers.

- 1- Justifiability (the numbers of presented answers): as number of answers which replied by student to questions was given a point to teacher.
- 2- Flexibility: the numbers of different ideas which given by respondents. The ideas are classified and a point is considered for each group.

- 3- Innovation and originality: to those answers which are replied by less of students, in other words, to those answer which are more uncommon was given an additional points.

**Data collecting method:**

After arranging test and investigating of reliability, the pretest is applied. Than the physics is taught by three mentioned methods (problem solving, cooperative and common one) in target schools for 3 months, then posttest is applied while the grades which are resulted of teacher's correction are considered as pre and posttest grades.

**The method of assessing reliability and stability of creative thought test**

**A)Validation assessment of tools:**

To assess validation of tools, content validation is recruited. Besides interviewing and advising to expertise, the questions are investigated as covering and proper for creativity assessment by calibration of above mentioned expertise, in other hand, they are classified as valuable as Gilford test.

**B)reliability assessment of tools:**

The split-half test (**Spearman-Brown**) is recruited to investigate reliability of test. In other word, the retest method is applied (Hooman,1995. Page 229). The creative thought test is tested in a class including of 35 persons while after splitting and assessing, the results are compered and correlated, the result shows a great correlation between two forms.  $R= 0/88$  indicates the accuracy of rest and shows this test is reliable and applicable for assessment of physics creativity on subject of junior student who study in Sistan&Balouchestan high schools.

**Data analysis method:**

The resulted data of pre and posttests of creativity in each class are compered b T-test in two groups of independent control case and study group. The Co- efficient formula recruited to assess the reliability of tools. SPSS software is recruited to analyze resulted data.

**Confounding variables:**

All kind of variables which can effect on creativity of students expect independents variables are disagreeable. Variables like media, school facilities, and the prior teaching method of teachers, motivation, stress, teacher's creativity as well their tendency into active teaching methods. Other distractors which are faced in this research are teacher motivation, their stress on this subject whether they can implant the mentioned method on classroom or not, teachers intelligence and their learning levels which were different and non-controllable.

**Controlled variables:**

- 1- Teacher tendency to recruiting of creative and active method
- 2- Teachers' educations: their educations were matched
- 3- Work experience of teachers: which all work experience matched.

4- Scholl facilities: two school which placed in Zahedan and facilities match are selected.

The sample is chosen randomly to nullify and control effective and distractive variables in creativity of groups.

**Data analysis**

Data analysis is one of the most important research process, and actually expresses the final result of research activity. In this study, the researcher analyzed separately the resulted data of pre and post tests for each student within every hypothesis by recruiting of testing differences between means in two dependent groups (T-test). A table is designed for each hypothesis which includes student number of target group, difference between means, standard deviation of each difference for every group, amount of **t** degrees of freedom and **sig** in the group. Finally, the shown results in tables are analyses and the null hypothesis is accepted for some cases as well the hypothesis contrary to fact for some cases. The null hypothesis indicates the test is not significant while the hypothesis contrary to fact indicates the test is significant.

**The first hypothesis:**

There is a significant difference between recruiting of problem solving teaching method in physics and common method on subject of appearing creativity in female junior students of high school.

Table 1: the results of T-test from data resulted of First hypothesis

Sig	df	t	Standard deviation of difference	Mean between differences	Number	Groups
0	35	4/493	6/208	8/105	19	Problem solving
			3/912	0/388	18	control

The above table shows the mean difference between pretest and posttest in field of creativity with target student and problem solving method is 8/105, while this value is 0/388 for control group, besides the difference between two means which have  $t = 4/493$  with the degree of freedom equal to 35 and level of 99 percent is statically significant. ( $P < 0/01$ ), so the hypothesis of study is confirmed. Therefore, it can be concluded there is a significant difference between creativity in junior female students of high school who are taught physics by recruiting of problem solving method and common method which are dominant in the schools.

**Second hypothesis:**

There is a significant difference between recruiting of cooperative teaching method in field of physics and traditional one regarding flourishing of creativity in female junior students of high school.

Table 2: the results of T-test on subject of second hypothesis data

Sig	df	T	Standard deviation of difference	Mean between differences	Number	Groups
0/002	38	3/309	6/320	6/045	22	Cooperative
			3/912	0/388	18	Control

The above table shows the mean between differences related to pretest and posttest in creativity on the target students regarding cooperative method is 6/045, while this value for control group is 0/388. Besides the difference between two means with  $t=3/309$  and the degree of freedom equals to 38 and 99 percent of level is statically significant, so the hypothesis of study is confirmed, therefore, it can be concluded there is a significant difference between creativity in junior female students of high school who are taught physics by recruiting of cooperative teaching method and common method which are dominant in the schools.

**Third hypothesis:**

There is a significant difference between recruiting of problem solving teaching method in physics and common method on subject of appearing creativity in female junior students of high school.

Table 3: the results of T-test from data resulted of third hypothesis

Sig	df	t	Standard deviation of difference	Mean between differences	Number	Groups
0/301	39	-1/049	6/320	6/045	22	Cooperative
			6/208	8/105	19	<b>Problem solving</b>

The above table shows the mean difference between pretest and posttest in field of creativity with target student and problem solving method is 6/045, while this value is 8/105 for control group, besides the difference between two means which have  $t= 1/049$  with the degree of freedom equal to 39 and level of 95 percent is statically significant. ( $P<0/05$ ), so the hypothesis of study is rejected. This means, there is no significant

difference between these two teaching methods regarding effective impact on subject of students creativity in physics.

### **Conclusion**

The findings of the present study are classified based on hypothesis. First, the target hypothesis definition, then the related hypothesis data, finally the interoperation and the reasons of accepting or rejecting of a hypothesis are expressed.

### **The first hypothesis:**

There is a significant difference between recruiting of problem solving teaching method in physics and common method on subject of appearing creativity in female junior students of high school.

### **Finding 1:**

Based on the achieved results, the research hypothesis is confirmed. it can be inferred the impact of active problem solving teaching method on subject of creativity training in junior student of high school is more than common and prevalent methods. The result of this study is in line with the studies which are performed by Omrani (1998), Hassani (2001), Saljouqi( 2002), Hussain (2011).

### **Second hypothesis:**

There is a significant difference between recruiting of cooperative teaching method in field of physics and traditional one regarding flourishing of creativity in female junior students of high school.

### **Finding 2:**

Based on the achieved results, the research hypothesis is confirmed. It can be inferred the impact of active cooperative teaching method on subject of creativity training in junior student of high school is more than common and prevalent methods. The result of this study is in line with the studies which are performed by Saljouqi( 2002), Hussain (2011).

### **Third hypothesis:**

There is a significant difference between recruiting of problem solving teaching method in physics and common method on subject of appearing creativity in female junior students of high school.

### **Finding 3**

Based on the achieved results, the research hypothesis id rejected. It can be inferred there is no significant difference between two methods of cooperative and solving problem in physics teaching regarding creativity training in junior students of high school.

### **Conclusion**

The results of data analysis shows active problem solving and cooperative teaching methods are more effective than prevalent methods regarding creativity training in junior students of high School for above mentioned lessons but the solving problem method is more effective regarding physics.

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