

Effect of One Minute Paper strategy in Development High Rank Thinking for Students of the First Intermediate Class in Sciences Subject

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Abstract:

This research aims to recognizing some modern learning strategies, such as: strategy of one minute paper in learning sciences subject for students of the first intermediate class and its effect in development high rank thinking, and for realizing aim of the research, we put a null hypothesis as the following:

"There is no difference has a statistical sense on (0.05) level between marks of the experimental group students who studied by strategy of the one minute paper, and marks of the control group who studied by the traditional method in the post test for the high rank thinking".

The researchers used a test of high rank thinking consists of (35) items, kind of choice from multiple, and the research sample consists of (93) students from the first intermediate class in Al- Azizya city in Waset governorate after the researches chose two intermediate schools: Bratha intermediate school, which studied students of the experimental group strategy of the one minute paper, and Al-Farazdaq which studied the students according to the traditional method for learning the sciences subject, after applying the experiment and after the researchers use the pre and post test of high rank thinking, the results show that there is a positive relationship between learning strategy according to the one minute paper strategy development high rank thinking for students of the first intermediate class in sciences subject.

In view of the research's results, the researchers recommended that training the lecturers and institutions in the field on using strategy of one minute paper, and the following styles within program of preparing and training unit in the directorate of education, and use them as an introduction for learning the students. The researchers suggested that put a study dealing with effectiveness of strategy of one minute paper in the creative thinking development, and the confidence level for students of the fourth year in course of the practical education in colleges of the basic education.

Key words: strategy of one minute paper, high rank thinking.

Problem of Research and its Importance:

That the progress in field of the science and knowledge led to appear a modern movements in the educational operation directed towards invest the student and his/ her powers and thinking about future. although that the

modern theory for education see that the student must be base or axis of the educational operation, and must be the effective element in solve all problems which face him/her in the educational stages. This impose on the education responsibility of preparing persons who have a sound thinking and use their minds instead of depending on others, where role of the students limit on the listening, receiving and remembrance, as well as padding their minds with knowledge and information only, without any interesting with the skill, emotional and mental sides (Saada, 2008: 33).

Subject of the sciences regards one of the important scientific subjects for student who facing in this subject a big problem in learning its concepts from the appearance, symbols, sense, and the positive and negative examples, so there is a difficult in understanding and reach the knowledge to the same meaning in their minds, the need appearance for existence modern strategies in the learning make the student an essential axis in the educational operation, and make them gaining thinking skills, therefore must interesting with methods which make students able in using their minds for solve the problems and all data, and discover a new ways and different solutions.

Throughout the researchers enlightening on the record which consists of first intermediate marks in most subjects, especially the science, the noticed that declining their marks, and discussed that with the teachers, the saw that most teachers followed the traditional method in the learning this subject, the most teachers don't care with linking between the theoretical and applicative side, with disregard many of them using the thinking in the learning, so disregarded modern strategies and styles in the learning, led to declining their level.

It is necessity that find realistic and effective solution in treatment this defectiveness and nourishment high rank thinking for students. Where the researches opine depend modern learning strategies help them on practicing high rank thinking skills. So, the research depend on one minute paper strategy for learning the sciences subject for the first intermediate school as one of modern learning strategies, which maybe participating in treatment some sides of the problem. As well as, that this strategy take care in employing the thinking in series and logic steps lead to building, inventing and challenge. Therefore, the researchers specified the research problem by answering the following question: what vestige of one minute paper strategy in development the high rank thinking for students of the first intermediate class ?

The education and learning taking up an important position in building the society and its development, especially that it is try to making mutations in human behaviours, and development his personality, in other words, they are lead to making change in notional, emotional and performing behaviour, and it is perennial operation began from his first years to his last day. (Zewor, 2012: 23)

So, most of the world states today aspirant to reforming the learning in general to moving to the new era which the traditional methods and styles can not start with societies towards advancement positions in the development progress. (Mohammad, 1990: 27)

The thinking and its development became one of the important basis in the modern educational system, which

make the educative that direct all their care and most of their effort to the role which performance by school because of it is one of the social institutions which reasonable on education of children and development their thinking abilities and skills in general, which lead finally to development the society. (Mazin, 2012: 34), where the problems faced us in our complex daily life require many solution. We can get them by operations of high rank thinking, that time educate the high rank thinking give to the students skills related with the daily life and take them additional benefit to help them in development their knowledge and thinking. (king, et, al, 1999: 8).

From the modern educational directions which have a huge effects in the learning operation is the active learning, which take active educational environment and regard as a part of educational philosophy depends on the students positive in the educational positions, including the educational practicing and learning procedures which aim to activation role of student and make him depend on himself to gaining on information, and forming the values and directions, the active learning don't focus on information gaining, but regard the method and style which make the students able to acquire the information and values. (Badawi, 2010: 218)

In addition to that the active learning require mental efforts and take them tools, abilities and instruments help them on the learning and change their directions in light of the huge knowledge revolution this days. (Amir Saeedi and Al- Huesna, 2016: 23)

The importance of the active learning appears in helping the learners on teaching the concepts and information which arouse their interesting and forming the positive directions towards the scientific subject, and allow to linking the subject content with the realistic life for the learner. (Badawi, 2020: 180)

One of active learning strategies is one minute paper strategy, which used for development way of traditional lecture teaching, which present to the teacher feedback about his students' progress, and for students to know their scores, and scope of their success. Where the teacher answer a question for the student in beginning of the lesson or through the lesson or in ending the lesson. Then the student answer the question scripturally, it is called paper of the one minute, where the teacher give (60) seconds, this strategy regard educational philosophy depend on learning positive in the learning position including all educational practices, and the teaching procedures which aim to activation the student role and push him for depend on himself in gaining the information and forming the values and directions, it isn't focus on the memorizing and lecturing, but on the thinking. (Jawad, 2020: 93)

Here problem of the research and its importance appear:

- 1- The research present a modern strategy agree with the educational directions which call for conveying the modernity in learning in shade of the rapid developments for using the modern technology.
- 2- Effect of the feedback in enhancement the learning operation by affixing the subject in mind of learner.
- 3- There is no any previous study dealing with effect of this strategy in development high rank thinking in sciences subject.
- 4- This research participate in exalt level of the high rank thinking, the high rank thinking make the student be

able on perfect benefit from learning.

- 5- Importance of the intermediate stage, where regard a transitional stage, the information gaining affect in the learning operation in the next stages.

Aim of the Research:

The present research aims to recognizing effect of one minute paper strategy in development the high rank thinking for students of the first intermediate class in sciences subject.

The Research Hypothesis:

For realizing aim of the research, the research put the following null hypothesis:

"There is no difference has a statistical sense on (0.05) level between marks of the experimental group students who studied by strategy of the one minute paper, and marks of the control group who studied by the traditional method in the post test for the high rank thinking".

The Limits of the Research:

The present research limits on:

- 1- students of the first intermediate class in (Waset) governorate, Al-Azyzia city.
- 2- The first term of 2019- 2020.
- 3- The chapters (first, second and third, the chemical elements, nature of the chemical interaction, and nature of the nucleus and atom) from sciences subject, edition 2017.

Term of the Research:

1- Strategy of the One Minute Paper:

- Identified by (Hativa, 2000): that "one of the active learning strategies, allow to all students participating in an active in learning operation, in addition to give a rapid and simple style for all students answers scripturally. And it is regard one of the reactive papers which used in different times through the lesson, where ask the students the answers written on the questions. (Hative, 2000, 204)
- Identified by (Murcia, 2001) that " one of the active learning, it is regard a direct device to know how the learners respond to the educational expertise which are present by teachers in form of written answers on one question or two. (Murcia, 2001: 502)

The Procedural Definition by Researchers:

That it is strategy for active learning including group of procedural steps base on correct learning of experimental group students by ask a question and answer about it and write it on the paper for one minute, it is nearest to the feedback in bahaviour explanation.

2- High Rank Thinking:

- Define by Lipman (Lipman, 1998): "the good thinking which include both critical and creational thinking, in other words it is equal to merging both styles of thinking, the critical thinking include the logical trial, where as the creational thinking include the mental trial, the good thinking consist of uniting the critical and creational

powers, where help the person on correct his thinking by himself, and think mentally". (Lipman, 1990: 35)

- Define by Newman (Newman, 1991): "the faculty on good depending for mental operations, this happen, when the student analyze and explain the information and treat them for answering the question, or solve a problem cant solve it by routine depending for information which learned them previously, include this thinking form come skills of critical, creational, posteriori, meditation, and diverging thinking, etc.". (Newman, 1991: 51)

The procedural definition for researchers:

That it is the first intermediate class students faculty on answering high rank thinking test which include number of skills which prepared for this purpose.

Theoretical Background and Previous Studies:

First: Theoretical Background:

A- Strategy of One Minute Paper:

This strategy regard from active learning strategies, it is appeared on Wilson writings (Wilson, 1986), and it developed by professor Scharz), it is give all students regular chances for participating with action in the learning operation, and give a docile and rapid way for gathering the written students answers. This technology define also that it is one minute paper, and respond of half paper about any subject, and it has other goals such as presences checking and test, and we can use it as an action for enhancing the readings and exercises, or in specifying scopes of the school content. (Wilson, 1986: 200)

This strategy include participating a huge number of students in the school classes, throughout the written responding which lead to motivating high rank skills, it gives a chance for all students a written participating not verbal for those whom participated permanently in the class discussions and exercises. This strategy easing the discussion and make the interesting focus on a certain point in the subject, it is a rapid way for realizing the student comprehending of the subject, and gives a brief feedback on specific questions. (Holtzman Richard, 2007: 68)

Using one minute paper in teaching can realizing some aims such as:

- 1- Development skills of notices recording.
- 2- Motivating interrogation.
- 3- Explaining the aims and intentions.
- 4- Correct understanding and compassing the subject before moving to another subject.
- 5- Benefit from the structural correction during learning operation.
- 6- Correct reactions of the students for actions and educational tasks.
- 7- Explaining the notions about nature of educational aims. (Jawad, 2020: 935)

Steps of applying one minute paper strategy:

- 1- In this step. the teacher distribute small papers on students and give them one minute for writing.

- 2- In this step. The teacher form a question or two, and write them on the blackboard, the students can throughout them answer rapidly and in short time.
- 3- The cooperation between two students, then change the answers and try to answer the question.
- 4- The teacher ask about the main thoughts which raise in student, this style is adjusting from one minute papers, the teacher replacing the two questions with encouraging students to recognizing on the main ideas which teaching in the lesson, and explain each one, therefore, this step regard a proceeding encourage the student on specify the main thoughts itself, and present the main thoughts.
- 5- The last step, the teacher gather the papers after end the time, and can read the students answers, and compare them, and use enhancing and encouragement phrase. (Angelo & Cross, 1993: 211)

We can use one minute paper in some positions in the class:

- We can use in beginning of class to know information about previous lesson/
- In the end of the class, and scope of benefit from the present lesson.
- Through a specific part of lesson.
- In any point we want to know scope of students progressing about it.
- When we want to help students in explaining their thoughts. (Al- Shamary, 2011: 48)

B- High Rank Thinking:

Some scholars see that the high rand thinking is rich in concepts, which include self-arranging for thinking operation, and try to the discover continuously. (Lipman, 1998: 34), as Al- Qamy pointed out that the high rank thinking include critical, logical, meditation, behind the knowledge and creational thinking, and those skills clarifying especially in leamer when he/ she face the uncommon and complicated problems, and the new position which need to complex solutions, then practicing those skills lead to take decisions and implementing the high mental performances. (Al- Qamy, 2015: 51)

Also, (Maykhan, 2017) from (Newman, 2001) say that enriching the scholastic approach with abstractive compositions or in the light of a certain knowledge content, represents an important step for learning skills of high rank thinking, where the students take a good marks, especially those who write wrong answers but these answers maybe justifying and supported by explanations reflect deep thinking treatment, comparing with the students who answers correctly, but their answers empty of glossing, explanation and explaining. (Mahmud & Hussein, 2019) add that much of high rank thinking concepts focused on three hypothesis about thinking and learning are:

- 1- Can not separating levels of the thinking from the learning levels, both are superimposed, each one has many levels, so we can evaluate skills of the high rank thinking throughout present the test questions from multiple and the teacher notices, and evaluate performance of the learners in the classroom and achievement files.
- 2- Learning of high rand thinking skills many thinking operations which can applying them in the

complex positions which include many changes.

- 3- That learning skills of the high rank thinking is difficult without existence of a subject for content, the students learn the daily life and from experiences of classroom and school. (Mahmud & Hussein, 2019: 183)

Forms of high rank thinking classification:

There are many classifications for skills of the high rank thinking:

- (North Carolina 1994) classification: this classification of high rank thinking skills which prepared by the general learning department of North Carolina state in 1994 represents a justifying copy for classification of the American Association for Development the Learning and Approaches which prepared by (Marzano et al, 1988), where combining (centering, information gathering and remembrance skills) in one field called (Knowledge), and added a field from Bloom classification (Applying) which ignored by (Marzano et al) in the American Association classification for the approaches and learning, where North Carolina classification included seven fields for thinking skills, and used for building tests of thinking in schools of North Carolina schools. (Mahmud & Hussein, 2019: 184)
- Bloom Classification: Bloom had present three classifications in three fields are (gnostic, skill and emotional), where represent in the Gnostic field six levels represent the first three levels such as: low thinking skills (remembrance, compassing and applying), as the las three levels represent (analyzing, composing and evaluation) from basic Bloom levels for the high thinking skills. (Al- Qarny, 2015: 61)
- (Lawrece, 2000) emphasize that learning of high rank thinking skills required students gaining the following skills: analyzing, composing, correcting, and applying, these skills are work on development this form of thinking. (Lawrence, 2000: 2)

Second: Previous Studies:

1- Studies related with One Minute Paper Strategy:

- Study of Fadhel (2015):

This study ran out in Baghdad aims to knowing effect of one minute paper strategy in creational procuring and thinking when teaching the society subject for students of literary fourth class, sample of research was (67) students, the experimental group which studied according to one minute paper strategy consists of (34) students, where as the control group which studied according to the traditional method consist of (33) students. Then, prepared procuring test consists of (50) items kind of choice from multiple, then depended Turans test for measure the faculty on the creational thinking, by using (Person linking coefficient), (Kuder- Richardson 21) and (difficulty coefficient, Kay square, differentiation coefficient, and the wrong substitutions) for analyzing results of the procuring test, the results show that there is different has a statistical sense on (0/05)

level for the experimental group, and there is different has a statistical sense on (0/05) level in the creational thinking for society subject for the experimental group. (Fadhel, 2015)

-Study of Al- Temimi (2017):

This study aims to knowing effect of using one minute paper strategy in the procuring and development the tendency to the history subject on students of the second intermediate class in Iraq.

The researcher chose two groups one of them to be an experimental group and another one to be a control group, the experimental group which studied according the one minute paper strategy consists of (42) students, where as the control group which studied according the traditional method consists of (42) students.

For realizing the research's aim, the researcher prepared a procuring test in history subject, and then realize its truth and fixity, and by using the T- test for two independent samples and treat the data statistically, showed that there are differences have statistical sense on (0.05) level between average of experimental group students marks which studied by one minute paper strategy and average of the control group students marks which studied by traditional method, and for the experimental group in the procuring. (Al- Temimi, 2017)

2- Studies related with High Rank Thinking:

-study of Mahmud and Hussein 2019:

This research aims to knowing effect of Barman form in high rank thinking on students of fifth secondary school in Islamic education subject in Iraq.

For realizing aim of the research, the researcher followed the experimental approach, and chose the experimental design which has partial control which has two groups experimental and control, the sample of research was (63) students distributed on groups of research, the experimental groups which studied according to Barman form contains (33) students, where as the control group contains (30) students, the researcher equalize between the two groups in changes of (age, brainy, study procuring for parents, the post test for high rank thinking).

The researcher prepared a special test for high rank thinking consist of (40) different items, the researcher be sure from its truth and fixity, the results showed that the experimental groups superiority on the control group in the post test of high rank thinking. (Mahmud & Hussein, 2019)

-Study of Mykhan 2019:

The research aims to knowing effect of using strategy of educational stations in procuring of firs intermediate class students for sciences subject and high rank thinking in Iraq.

For realizing this aim, the research depended on the experimental design which has the partial control, the research sample amount (68) students distributed (34) students for the experimental group which studied according to the educational stations strategy, and (34) students for the control group which studied according to the traditional method, the researcher equalize between both groups in changes (brain test, age, marks of last information test in sciences subject).

Prepared one of the two tools is the procuring test, the researcher adopted test (Al- Atabi, 2015) for high rank thinking, the test consists of (45) test items, and then calculate the their psychometric characteristics and fixity, and analyze data and treat them statistically, the results showed that superiority students of the experimental group on control group in procuring the sciences subject and the high rank thinking. (Mykhan, 2019)

Indicators and Denotations from the Previous Studies:

- All studies which mentioned prove its potency in changes of one minute paper and high rank thinking strategies.
- The researchers benefit from previous studies in knowing the scientific steps in building the scholastic plans according to the one minute paper strategy.
- Also the researchers benefit from previous studies in knowing how preparing test of high rank thinking.

Procedures of the Research:

First: The Experimental Design:

The researchers used the experimental design which has one experimental group representing in measuring test of the high rank thinking in the post and pre tests, as shown in diagram (1), the researchers equalized the research groups with suitable changes.

group	The two groups equivalence	The independent change	The inferior change
experimental	1- age (months) 2- previous procuring 3- test of depictive brainy	Teaching according one minute paper strategy	Test of high rank thinking
control	4- test of high rank thinking	Teaching according to Traditional method	

Diagram (1) the experimental design for the research

Second: The Research Society and sample:

We chose students of the first intermediate class in Waset governorate in Al-Azyzia city for 2019-2020, the final number of the sample was (93) students, (45) studied the sciences subject according to one minute paper strategy, they are students of the experimental group for Baratha intermediate school, but students of the control group (48) students for Al-Farazdaq intermediate school studied the sciences subject according to the traditional method, after researcher equalized in school change throughout its nearby the city, as well as in change of teachers of the scientific subject, and training them on teaching the educational strategy for one minute paper, then eliminated the failure students statistically.

Third: The Research Tool:

consist of:

Test of high rank thinking: the researchers papered test of high rank thinking contains in its final copy from (35) items from the scientific subject for sciences in form of procuring test which has high gnostic level in the analyzing, composing, evaluation and development from kind of triple choice, the researchers showed this test on experts committee in field of educational and psychological sciences in college of education for humanitarian and pure sciences in Waset university to finding the truth of test and scope of accommodating of this kind of tests for the local environment, after adjustments, the test became consists of (35) items with the original form.

Fourth: applying the experiments:

After ending the research procedures and its groups each one according to the teaching strategy, and after (60) days on taught them, specified a day for implementing the test for measuring high rank thinking on their students (students who submitted for research), applied the experiment on 4/10/2019 and it is ending on 1.12.2019, then correct the students answers and treated statistically by using T- test.

Showing and Discussing the Results:

- the null hypothesis for research: there is no differences has a statistical sense on (0.05) level between average of the experimental group marks who studied according to the one minute paper strategy and marks of control group students who studied according to the traditional method in the post test for high rank thinking.
- results of the research in the table (1) showed that there are differences have a statistical sense between both groups of the research (experimental and control) for students of the experimental group which studied according the one minute paper strategy in sciences subject.

Results of using T- test for finding the differences

Strategy	Students Number	Computational Average	Imparity	T - calculated	T- table
One minute Paper	45	97	12.373	2.0115	1.982
Traditional Method	48	92.104	11.243		

So, the null hypothesis refused on (0.05) level, the reason is most students tend to using the one minute strategy in teaching the sciences subject, also can assign this result to that one minute paper strategy is an easy

style in giving a huge amount from subject, and completing the approach in analogical time after trained the students on scientific solution steps for the chemical question according to the educational plan, as well as, (Atya, 2015) indicates to the reasons which push students to using (method of listening and examining in one minute paper), one of strategies kind in their teaching that they are high readiness, and because they are explains basically that teacher and student are axis of the educational operation throughout interchange the roles, in addition to jam the classes, and abridge in time, materials and devices, as well as that is a style avoid using the experiences, dangerous materials and lateral discussions. (Atya, 2015: 89)

Conclusions:

- superiority students of the experimental who studied by using the one minute paper in development test high rank thinking in the sciences subject in first intermediate class.

Recommendations:

- 1- Training the students in the educational occupational field on using the one minute paper and the following styles within program to teaching students in the educational colleges.
- 2- Using strategy of one minute paper as an introduction to teaching approaches and methods learning the sciences because of this sciences including a scientific concepts, like this strategy maybe more effect in learning the scientific tendencies, students performance and level of their thinking.

Proposals:

- 1- Executing a study dealing with effect of using one minute paper strategy in development the creational thinking and level of confidence for colleges of the basic education.
- 2- Executing another study dealing with other changes and another scholastic stage.

Resources and References:

Arabic Resources:

- 1- Albo Saeedi, Abdullah bin Khamis and Al- Huesna, Huda bint Ali (2016), the **Activist Learning Strategies**, edition 2, Amman, Dar Al- Masirah for publishing and distribution.
- 2- Badawi, Ramadan Saeed (2010), **Activist Learning**, Amman, Dar Al- fiker for publishing and distribution.
- 3- Al- Timimi, Huda Fadhil Hussein, (2017), **Effect of Using the One Minute Paper in Procuring and Development the Tendency towards History Subject on Students of the Second Intermediate Class**, Adab Al- Mustanseryah magazine, no. (77).
- 4- Jawad, Raghad Ismail (2020), **Effect of One Minute Paper Strategy to Procuring the Prophetic Sirah and Save it on Students of College of Education**, college of education magazine, Waset university, researches of the second international conference/ Iraqi academics union/ center of the academic and strategic development and university of Sallahdin/ college of basic education/ Erbil

10-11 February, 2020.

- 5- Zewor, Mohammad (2012), **The Education World (its Essence, History and Requirements)**, Beirut, Dar Al- Hadi for publishing.
- 6- Saada, Jawdat Ahmed (2008), the cooperation Learning theories, applications and studies, edition 1, Cairo, Dar Al- Awaeel for publishing and printing.
- 7- Al- Shamari, Mashi bin Mohammad (2011), **Strategy in the Activist Learning**, edition 1, Kingdom of Saudi Arabia, Ministry of Education and Learning.
- 8- Fadhil, AbdulElah Hamid (2015), **Effect of Using One Minute Paper Strategy in Procuring and Creational Thinking in Teaching the Society Subject on Students of Fourth Literary Class**, college of basic education magazine, vol 21, no. 21.
- 9- Al- Qamy, Misfer bin Khudher (2015), **Effect of Using Learning Reposing to the Brain Strategy in Teaching Sciences on Development High Rank Thinking and Some Brain Habits on Students of Second Intermediate Class who have Different Brain Control Modes**. Published PhD dissertation, college of education, Um Al- Qura university, Kingdom of Saudi Arabia.
- 10- Lipman, Mathew (1998), **The School and Thinking Education**, translated by: Ibrahim yahya Al- Shihabi, Damascus, ministry of culture publications.
- 11- Mazin, Yousif (2012), **Methods of Learning between Theory and Application**, edition 1, Beirut, modern institution for book.
- 12- Mykhan, Haifaa Adnan (2019), **Effect of Using the Scientific Stations Strategy in Procuring Students of First Intermediate Class in Sciences Subject and High Rank Thinking**, college of basic education magazine, vol (25)m no, 103.
- 13- Mohammad, Sabah Mahmud (1990), **The Academic Reforming in Iraq**, edition 1, Baghdad, Dar Al – Rashid for publishing and distribution.
- 14- Mahmud, Raeed Edris& Hussien, Ehsan Nadher(2019), **Effect of Barman Form in Development the High Rank Thinking on Students of Fifth Secondary Class in Islamic Education Subject in Iraq**, the international magazine for educational and psychological studies, vol 5, no. 2.
- 15- Atya, Ali Mahmud (2015), **The Counting and Learning Styles**, edition 1, Amman, Dar Al- Masirah for publishing and distribution.

Foreign Resources:

- 16- King, FJ, Goodson , L& Rohani , F (1999) , **Higher order thinking skills**, A publication of the Educational services program , www.cala.fsu.edu
- 17- Hative Richard Gibbons : **Adapting the one – minute paper for active Learning** , 2007 .

- 18- Murcia Celce-, Marianne (Editor). (2001) .**Teaching English as a second or Foreign Language**. (3rd Ed) USA. Heinle and Heinle publishers.
- 19- Newmann, F.M (1991): **Promoting Higher Order Thinking skills social studies** , Over view of a study of 16 High school Department.
- 20- Wilson. R.C. (1986), Improving faculty teaching : **Effective use of student evaluations and consultants** . Journal of Higher Education 57: 196–211.
- 21- Holtzman, Richard Gibbons (2007), **Adapting the one – minute paper for active learning** , publication: Academic Exchange Quarterly.
- 22- Angelo and Cross: **Minute paper classroom assessment techniques**, Francisco : jossey – Bass, 1993.
- 23- Lawrence, A (2000). **The Concept of Metacognition**. [http// www.face.nova.ed/ Lawalain / deproj.html](http://www.face.nova.edu/Lawalain/deproj.html).