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European Journal of Experimental Biology, 2014, 4(2):232-236

ISSN: 2248 –9215
CODEN (USA): EJEBAU

Designing the pattern of understanding-based teaching in the lesson of science and the evaluation of its role on thinking skill creative of fourth primary grade

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ABSTRACT

The purpose of this research was to design the pattern of understanding-based teaching in the lesson of science and the evaluation of its role on thinking skill creative of fourth primary grade. The method of the present study was an applied type and the semi-experimental one. So, 60 students of fourth-grade of Javanrood Town were selected randomly during 2012-2013. Torrance creative questionnaire thinking questionnaire was applied to collect the related data. T dependent test was applied in order to compare the means of both groups. The results showed the completion of understanding-based model can be effective in students' producing various ideas at fourth grade primary school growing their knowledge in this regard.

Key words: teaching, science, thinking skill, creative, fourth primary grade

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INTRODUCTION

Teaching method is one of the basic elements of the syllabus design and a general plan that assists the entire students to learn their lesson tasks and various knowledge, attitudes and skills in this regard. A teaching pattern should have a theoretical foundation making the high potential teaching methods for reaching to the educational suitable consequences [8]. Based on the carried out studies in 1990s and early 21th century, the tendency of the educational experts towards the teaching method is subjected to the categorization of these patterns in this case. Some patterns aimed at supplementing the related targets while other ones have got vast applications in this path. Some of these patterns are formal following regulations and special ways and some others have got informal features. These patterns seem to be very applicable in terms of educational purposes to supplement the whole personal, social and scientific targets potentially reaching to the main thesis of the entire teachers in this relation successfully [8]. The categorization of these approaches or general teaching methods [4] has been categorized into four branches as following:

1-The social models family
2-The information processing family
3-The personal family
4-Concept-based family

This model has been compared with two dimensional traditional or the designing of lesson plan on the subject. These two dimensional models are concentrated on the realities and skills. But three dimensional models have been focused on the concepts, realities and skills. The three dimensional models can challenge the intelligent and emotions of the whole students in a higher level assisting them to take the best way in this regard. In this model, the whole realities are considered as the main target of the concept-based issues. But they have been used as instruments for accessing to the deeply meaning and understanding of the concepts and approaches [4]. Thus, due to the above mentioned statements, the present study is to investigate the concept-based model as one of the information-processing family.

Designing the concept-based model:
Tension et al (1986) carried out important researches in relation to the learning concepts; these researchers compared two kinds of educational subjects together. In one method, the students have been given the concept definition and then the samples and examples. In another method, the samples and example were firstly given to the students and they have to define the related definitions in this case. The results of the present research showed that the second method the subjects and topics can persist for a long time in students' memory in this case. The model of concept perception has been designed based on this to help students in the process of learning; of course the studies of Broner are also effective in this regard in relation to the thinking way. In this model, the concepts and definitions have not taken directly at students' accessibility. First the samples of these concepts should be devoted to the related process such as positive and negative samples in this case. According to Bruner's viewpoint the recognition of the correct examples from incorrect ones is easy for the whole students. Indeed, the learners can recognize the necessary features before recalling the concept name [5].

The model of concept perception can provide the analysis of the thinking way and effective growth stream for the entire students.

Steps of completing the concept model have three main approaches as following:
The selection of suitable understanding and its arrangement in positive and negative frameworks by teacher, the comparison of positive and negative samples with together and the hypothesizing of students

Accessibility to the concept:
Giving more samples, confirmation of a correct hypothesis, naming the concept and the utterance of definitions by teacher

Analysis of thinking way:
Group discussion about the hypotheses, the representation of thinking steam of students for accessing to the concept by student

Thinking skills:
It has got two dimensions:
1-Intelligence skills
2-Skills of higher thinking level

Usually the processing of information is the regular basis of the thinking process. The thinking skills is a collection of actions, steps and methods as well as regulations that they are always more complex than other methods. Two important skills in the process of thinking are as following:
1-Critical thinking skills
2-Creative thinking [11].

Creative thinking:
The educational experts look they observe the creative thinking as a productive and new way of thinking process; they are actually supplement together having common points in this relation. The creative thinking depends on the critical thinking. Due to the complexity of the thinking process and its inseparable dimensions in the process of completion, the lesson syllabus designs have to be the reflective of the realities in this case; the creative thinking leads to the high potential creation issues [11].

The experience of designing the understanding-based model based on thinking skillcreative in Iran:
Mohseni Tabrizi (2002) in his thesis titled ‘’the effective social factors on creative thinking in primary school children’’ has pointed to the determination and analysis of the effective social factors on children’s creative thinking ways. In order to access to the purposes of the research, the standard test of children creation, interview, observation and contextual analysis have been applied efficiently.

The sampling method is the categorization accidental way that 390 fifth graded students of Tehran City were selected in this regard. the results of K-Square test, regression analysis, analysis of the path and variance analysis also showed that the variables of family, recreational facilitations, internal factors, skills, mass media, games and training creative thinking of children has a significant correlation in the related study.

The international experiences have been given in relation to the designing of an understanding-based model on the thinking skill.
Bredderman (1981-1983) covers the vast sciences plans of primary classes by the application of the processing information. His reports represent the positive impacts of this method on creation and learning the science lesson.

El-Nemr (1979) concluded the following results according to his research on the training of biology lesson applied by the processing of information method in this case.

Hillok (1987) in his research carried out on training of writing showed equal results with above mentioned studies. In fact, the impact sizes 0.60 on the related approaches are reported from their understanding-based issues in compare to training the same topics without the establishment of the topic in teaching methodology.

MATERIALS AND METHODS

The methodology of the present study is an applied type due to its purpose and the semi-experimental method was also applied to collect the related data.

Statistical community:
The research community of the research includes the entire students of fourth-grade of Javanrood Town during 2012-2013. Based on the statistics of the town’s management, the number of the students is 250 ones.

Sample and sampling method:
The clustering sampling method was applied to select the sample in this study. For the reason, a school was accidentally selected among ten governmental schools. The related school had two fourth grade classes that every class had 30 students and then the researcher grouped the class into an observation and experimental group. By the use of three similar researches, the sample volume was selected 60 people in this study (30 in observation and 30 in natural sciences group).

Data collection instrument:
Torrance creative questionnaire thinking questionnaire was applied to collect the related data. Torrance creation questionnaire has 60 questions being designed as standard and their validity and reliability was experimented; every question has three options or responds. Torrance (1979) considered the creation in 4 main elements:

1-Political: the power of producing ideas and galore of responds (questions 1-15 for measuring the political dimension of the creation)
2-Flexibility: necessary ability for changing thinking orientation or the ability of producing various ideas (questions 16-30 for measuring people’s flexibility)
3-Innovation: ability at producing the ideas or new innovative thinking production (question 31-45)
4-Details: ability of paying attention to dependent details of an idea (questions 46-60 for measuring the details of the creation)

Scoring method of Torrance creation test:
Soft table of Torrance test:
The degree of creation score-very high creation: 120-100 high creation: 100-85, moderate: 85-75, low: 75-50 and very low: 50 and lower.

Technical features of data collection method:
The questionnaires of Torrance creation have been normed on 483 ones. The validity coefficient was 0.871 obtained having its own validity [7].

Data analysis method:
In order to compare the means of both groups, T dependent test was applied that the degree of DF equals n-1 in this study.

RESULTS

The representation of the findings of a research can have various forms due to its arrangement. The representation of this arrangement is an imperative issue that has to be planned before; the best way of structural arrangement is to represent the related findings due to the research questions [9].

Table 1: comparison of post scores of producing various ideas in observation and experimental groups

Indices / groups	N	M	Std dev	M std err	M frac	T	Df	Sig
Observation group	30	14.95	0.81	0.15	0.47	2.728	29	P =0.011
Experimental group	30	15.42	0.66	0.12				

As it shown in table 1, the obtained degree for T statistics test equals 2.728 at 0.05 sig level ($p< 0.05$); hence, it can be concluded that along with 95% confidence level the hypotheses H0 and H1 are confirmed; that is, there is a significant difference between the observation and experimental groups. Based on this and due to the mean scores of producing various ideas of experimental group (15.42) is higher than the observation group (14.59). The fraction of these means is 0.47 positive; so, it can be concluded that the completion of understanding-based model can be effective in students' producing various ideas at fourth grade primary school growing their knowledge in this regard.

Table 2: comparison of post scores of producing various innovative thinking in observation and experimental groups

Indices / groups	**N**	**M**	**Std dev**	**M std err**	**M frac**	**T**	**Df**	**Sig**
Observation group	30	10.88	0.89	0.16	0.25	2.715	29	P =0.011
Experimental group	30	11.13	0.78	0.14				

As it shown in table 2, the obtained degree for T statistics test equals 2.715 at 0.05 sig level ($p< 0.05$); hence, it can be concluded that along with 95% confidence level the hypotheses H0 and H1 are confirmed; that is, there is a significant difference between the observation and experimental groups. Based on this and due to the mean scores of producing various ideas of experimental group (11.13) is higher than the observation group (10.88). The fraction of these means is 0.25 positive; so, it can be concluded that the completion of understanding-based model can be effective in students' producing various ideas at fourth grade primary school growing their knowledge in this regard.

Table 3: comparison of post scores of paying attention to details in observation and experimental groups

Indices / groups	**N**	**M**	**Std dev**	**M std err**	**M frac**	**T**	**Df**	**Sig**
Observation group	30	6.58	0.79	0.14	0.54	2.346	29	P =0.036
Experimental group	30	7.12	0.84	0.15				

As it shown in table 3, the obtained degree for T statistics test equals 2.346 at 0.05 sig level ($p< 0.05$); hence, it can be concluded that along with 95% confidence level the hypotheses H0 and H1 are confirmed; that is, there is a significant difference between the observation and experimental groups. Based on this and due to the mean scores of producing various ideas of experimental group (7.12) is higher than the observation group (6.58). The fraction of these means is 0.54 positive; so, it can be concluded that the completion of understanding-based model can be effective in students' producing various ideas at fourth grade primary school growing their knowledge in this regard.

DISCUSSION AND CONCLUSION

In this present study the understanding-based teaching model has been carried out at the fourth grade students. The results of the study represent that the participation of fourth grade students in the program of understanding-based teaching model has been effective on their thinking skill increasing their thinking skill. Every three hypotheses was

confirmed; that is, the completion of the understanding-based teaching model was effective in the abilities of producing various ideas, new production and innovative affairs as well as the dependent details.

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