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Comparing the Effect of Educating Environmental Issues via Cooperative Image-Concept Approach and Common (teaching) Method on Students' Learning and Naturalism in Elementary School

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ABSTRACT

Changing individuals' knowledge and viewpoint especially the youth and teenagers as decision makers of next generation through educating is one of the most important concerns and policies of policy makers of the environment. In present study, to survey and compare the effect of performing Image-Concept Approach as well as common teaching method on the amount of learning, and the amount of students' naturalism in elementary schools' sixth-grade in science course in the area of Mahidasht-Kermanshah, the quasi-experimental plan with two groups (n1=20 and n2= 20) was used to answer this question whether or not the learning performance and the amount of naturalism is statistically different among students educated by this pattern? In two study groups, students learned the concepts of the relation between human and environment via using Image-Concept Approach and the common method, respectively. In order to collect data, the teacher-made learning test and scale of the relation with nature by Nisbet and et al (2009) was used that after being approved in terms of validity and reliability, it was performed before and after applying quasi-experiment and the data were collected. The survey results show that learning is higher among students using Image-Concept Approach with another group and also in term of naturalism, student taught by Image-Concept Approach had more positive attitude regarding nature in comparison with control group.

Introduction

In order to meet basic necessities, the human being needs an environmental relation which it results in environmental behaviour. Therefore, he faces two principal decisions, i.e. "how to make relation with others as well as environment" so that, sooner or later his relation with other people may affect his living environment and following it, change and evolution in his environment and finally suitable environment of behavior or environmental problems are made (Badri Gregori and et al, 2012). The world's rapid population growth and environmental pollutants' massive attack have made the conditions in that nature recreation is lagged respecting its recreation. Coming industrial revolution in 17th century, humanly considered the nature as consuming goods to benefit from as much as he can. He knew very late that nature has a restricted capacity for revival (Onal & Kizilcaoglu, 2011). Today, the environmental issues around the world have reached a critical phase. The witness to indicate this is environmental disasters such as tsunamis, earthquakes, the ozone layer's problem, acid rains, global warming and different pollutions (Lateh & Muniandy, 2010). One of the ways to overcome this is to have people educated about the environment via programs and activities depicting for people (Sayed Abdullah & Halim, 2010). Harris (2006) states that one of the ways to tempt individuals' feelings as well as behaviours is through local efforts. This belief is distributed through Olsson and Halfman (2006) in that they believe that drawing people's attention to the environment is certainly related to education and training. Ignatow (2006) mingles education with the environment through ecological ideologies. This concept explains that human beings are dependent on the environment rather than being detached from it and the science can interfere here to get human beings have a suitable relation with the environment(Sayed Abdullah & Halim, 2010).

During last 30 years, many of the psychologists and sociologists have looked for direct or indirect roots of environmental activities but answering to this question that "why do people have such behaviours?" and "what are the obstacles regarding keeping the environment?" is difficult (Kollmuss & Agyeman, 2002).

The enhanced amount of environmental problems has caused a lot of non-answered questions respecting the necessity of environmental teaching through school's curriculum (Hassan & Zaid Ismail, 2011). And this has involved the education planners and practitioners but education by itself does not guarantee suitable environmental behaviours because the variety of the learners have shown that in the majority of the cases, knowledge and awareness enhancement do not result in environmental behaviours (Kollmuss & Agyeman, 2002). The oldest and simplest pro-environmental behaviour models based on linear progress used to result in environmental awareness and this cycle used to be taken for granted as pro-environmental behaviours. Rational models were also formed to consider this that to have people educated will lead into pro-environmental behaviours

(Kollmuss & Agyeman, 2002). But in the early 1970s, it was proved soon that those models were wrong.

The aim of educating is to make people knowledgeable in term of environment knowledge in such a way that person understands environment's value and guard it (Manzanal, 1999; Schlesinger, 2004; quoted by Dibaee and Lahijanian, 2009). In addition to knowledge, human being's attitude toward the environment and its importance in predicting environment behaviours have been the focus of researchers' science a long time ago. In last patterns for assessing attitude, it is assumed that being aware of specific realities can cause being influenced by it. For instance, Aizen (1989) says that if people do not get convinced that some causes are contributed to their environment, they will not have the negative attitude about it and human's knowledge toward environment affects his belief about the environment (Kaiser, 1999; quoted by Ferdosi and et al, 2007).

The results of experimental studies have shown that there is the difference between attitude and behaviour. Many of the researchers have tried to describe this gap. Rajecki (1982) for instance, has explained some reasons for this that the most important one of them is "direct experience versus indirect experience". According to him, direct experiences have more affectivity on people than indirect experiences. Put in another word, indirect expressions taught about schools' environmental problems for instance versus indirect experiences such as seeing a dead fish I river cause a weak correlation between attitude and behaviour (Kollmuss & Agyeman, 2002). Durden and Witt (2010) also have shown in a study that in teaching environmental problems using direct experience, whole participants' attitude and knowledge may progress alongside each other but in indirect experiences educational programs, environmental knowledge has progressed more in comparison with attitude. Also, making motivation for keeping the environment in direct experience educational programs seems stronger (Durden and Witt, 2010).

Researchers have proposed different solutions for solving environment problems that most of these remedies are technical but due to many expenses of these plans, they have turned to the changes of people's way of living. There are variant theories about environmental education. What is inferred in Iran is that this does not include whole people now and it is not placed in schools curriculum. Therefore, if our schools are going to affect students' knowledge, attitude and performance in a positive and deep way, they need to change their teaching methods basically to have students equipped with creative, fruitful and useful knowledge and performance. Creativity in educational activities is a phenomenon that includes a lot of essays and books as well as abundant researches (Zamani and Liaghtdar, 2003). One of the courses in schools elementary grade has paid attention to environmental issues is science. The aim of teaching science before conveying scientific facts is that student finds scientific behaviour and he can accommodate his needs with an environment, facing with natural life environment. And can use resources that he has and improves his life. Certainly, no one can teach the science via giving the lecture or repetition (drilling). So, selecting a proper template by a teacher is an essential affair.

Because of this, this study is going to apply a template in teaching environmental issues of sixth grade of elementary school in that is considered as a new pattern in Iran and is related to meet the science course aims but unfortunately, there has been little research about it. This pattern with title of "Image-Concept Approach" as a new pattern and based on training ideas of Benjamin Bloom, Hilda Taba, Gerome Bronze, Goodna and William Austin, is added to Picture Word Inductive Model by Bruce Juice, Marshal Will and Emily Kalhoon and is located in the family of information processing patterns (Behrangi and Fraghi Wayghan, 2008). Image-Concept Approach is considered as those dynamic teaching and as a new pattern (approach) includes preparing situation for students cooperation, using suitable learning technology, course complete designing, preparing learning environment for compromise and cooperation, genetic assessment, gaining modeling skills for independent learning among those learning groups with title of life skill, investigating learning itself meanwhile it is being performed and flourishing students creative sense (Behrangi and Fraghi Wayghan, 2008). This approach advocates learners' curiosity and lets them think in an inductive way (Mousavi, 2008). In this pattern, the basic role of learning-teaching is related to students. Therefore, a teacher plays the role of a guide, leader or accelerator and obliged to prepare learning situation. The image in this pattern is a set of correlated images including the course main theme that in its ordinary form, it is drawn on board through teacher and students cooperation and teaching are based on it. But, this study aims to apply this pattern using students' cooperation regarding selection and preparing necessary teaching images contributed to the ethnic-local environment as well as their eagerness and attitude and also to consider the difference of this approach's effect and compare it with the common teaching method in Mahidasht.

Materials and methodology

This survey is applicable in term of goal and it is Quasi-Experimental based on method. In this study, 2 classes of students in sixth grade in two different parts of Mahidasht were chosen and according to the principle of random assignment, they were assigned to treatment and control groups. Treatment group and control group contain 20 and 20 students, respectively. To participate in selecting suitable subjects for the environment in order to prepare educational images based on educational purposes, students of the first group chose the topics according to Image-Concept Approach and students of a control group were taught using teaching in its common way. In both groups, the issues related to human being and the environment were taught in 10 sessions with elapsed time of forty-five minutes and based on behavioural goals. Effects of variables such as gender (coeducation), chronological age (11 years), and the educators' effect (teaching by the researcher himself) were controlled. Manipulating independent variable, i.e. giving education using Image-Concept Approach (based on real images) to treatment group as well as educating control group according to the common method in district (lecture-based and descriptive), its effect on depended variables, i.e. the enhanced performance of students in target components in this study (learning, and their naturalism amount) were assessed.

To collect data in this study, observation, teacher-made test as well as the scale of relation with nature is used as follow:

1. Observation. to determine the common teaching method in Mahidasht, observing teachers teaching the method in the class and interviewing 10 of experienced teachers and through using 18 years of researcher's teaching experience in mentioned area were used to determine common and dominant teaching methods in the study area.

2. Before and after teacher- made test. To compare two groups of treatment and control in terms of the amount of previous knowledge and to determine the effect of each one of the depended variables at the beginning of the study, a test including 60 questions about target issues in this study (human and the environment) were prepared. This test was given to 2 of experienced teachers in sixth grade. After investigating questions by teachers, about 2o of the questions were eliminated and other questions were categorized accidentally into two categories with 20 questions to be used in the pre-test and post-test.

3.Assessment test of naturalism. To assess the amount of naturalism among students before and after performing the plan, the Nature Relatedness Scale by Nisbet and et al (2009) was used. This scale contains three subscales of self-feeling, landscape and universal viewpoint on nature and physical experience regarding nature and 21 items in Likert. The way of answering anyone of the subjects to the any of the questionnaires materials is so that they express their sense from "I completely disagree" (1) to "I completely agree" (2).

The distinguish sense and determining the difficulty of any of the questions was determined using statistical methods. In the present study, the reliability if the tools (teacher-made questions) using re-assessing method based on same internal coefficient is 0.81 that it is a relatively high reliability and is approved. To assess the amount of students' environmental attitude, the standardized scale of relation with nature by Nisbet and et al (2009) was used in such a way that its reliability is gained using re-assessing method in a group of 30 students with the population of 0.85.

To analyze the data, the features of descriptive (average and standard deviation) and referential statistics (analysis of covariance) were used to facilitate generalizing findings of the sample on the population.

Findings

In this section, study hypotheses are proposed at first and then the results from computing statistical tests are presented.

Hypothesis 1. There is a significant difference between students of two groups (educated by Image-Concept Approach and educated by common method).

To investigate this hypothesis whether or not there is a significant difference between the results of both groups learning (Image-Concept & common method) after controlling previous knowledge's effect (pre-test), the covariance analysis was used. The results show that the data follow the sameness hypothesis of regression slopes. Also results of Levene's test for investigating the sameness of variances show that hypothesis data has not questioned the equality of variance error and in other words, the variances of both groups are the same. After moderating the pre-test scores and using covariance analysis, the significant effect of teaching method (F=25.58, sig=0.000) was approved, considering Ata coefficient one can say that teaching method can determine post-test score after moderating previous knowledge effect to 41% (Table 2).

Also, the gained scores indicate that Image-Concept teaching method (14.96) has had more effect rather than common method (11/99) in enhancing students' learning (The averages are out of 20).

Hypothesis 2. There is a significant difference between two groups (educated by Image-Concept Approach and educated by common method) in term of naturalism

To investigate this hypothesis whether or not there is a significant difference between performance results of both groups (educated by Image-Concept Approach and educated by common method) naturalism after controlling previous knowledge effect (pre-test), covariance analysis was used. Results show that data follow regression slopes. Also, the results of Levene's test to investigate the sameness of variances show that the supposed data have not questioned variance error and put in another words, the variances of two groups are the same. After moderating pretest scores and using covariance analysis, the significant effect of the kind of teaching method (F=19.32, sig=0.000) was approved and considering Atami coefficient, one can say that the kind of teaching method can determine naturalism after controlling previous knowledge effect with the amount of 34 % (Table 2).

The gained moderated averages also clarify this that the Image-Concept Approach (82.54) has more affectivity in comparison with common method (71.41) respecting students' retention (The averages are out of 105).

Discussion and conclusion

The basic question of this study is comparing the effect of benefiting from students' cooperation in choosing necessary educational subjects to imaging according to ethnic- local environment in teaching using Image-concept Approach in comparison with common teaching method, on students' level of learning as well as naturalism in elementary schools sixth grade in Mahidasht regarding "human and the environment" from the science course. Therefore, this study was formed given this assumption that there is a significant difference between the level of students' learning and naturalism taught by Image-Concept Approach with students taught by the common method (lecture and description). Investigating study results show that the effect of teaching method (Image-Concept Approach) and also students' cooperation regarding choosing as well as providing images via ethnic-local subjects have been manifested in students' performance in term of depended variables.

The results of this survey correspond in terms of the influence of Image-Concept on learning with investigations and respecting educating environmental issues in different ways and their affectivity on students' viewpoint toward the environment and show that one can increase the amount of students learning comparing traditional methods in science course, using Image-Concept Approach based on real images as well as their consulting.

Table 1. Tests of Between – Subjects Effects.

Source	Type lll Sum of Squares	Df	Mean Square	F	Sig	Partial Eta Squared
Pretest	50.59	1	50.59	15.84	0.000	0.300
Group	81.68	1	81.68	25.58	0.000	0.409
Error	118.16	37	3.19			
Total	7487	40				

Table 2. Tests of Between – Subjects Effects.

Source	Type lll Sum of Squares	Df	Mean Square	F	Sig	Partial Eta Squared
Pretest	506.25	1	506.25	8.66	0.006	0.190
Group	1129.23	1	1129.23	19.32	0.000	0.343
Error	2162.5	37				
Total	241457	40				

One of the effective activities in benefiting from media and educational aiding materials is attracting learners' attention (Khaghani Zade and Shokrolahi, 2009). Students' cooperation and companionship in choosing image along with necessary educational subjects based on ethnic-local environment to teach in target place, causes motivation and eagerness among them and meanwhile creates this sense of which to be more curious in relation with their environment as well as issues and problems related to it and to look around with more consideration, is based on new approaches of research orientation advocating educational activities election based on idea, eagerness and viewpoint of students. Being familiar with visual subjects of ethnic local environment makes them have more influence on the plan and see their environmental issues in a new point of view. Also, according to Mayer, simultaneous using of images and lexicons in designing educational media can affect its affectivity and consider this principle in Image-Concept Approach, provides students with an opportunity to make a mental-visual model creating mental, visual and verbal models. In addition, presenting images on a big visual map in a general way along with writing lexicons and concepts by students around the big image's border causes the principle of spatial proximity and exposure time following that and causes learners not to be obliged to consume their cognitive resources searching for visual pages and to be able to keep both of them in their active memory and to provide simultaneous presenting of image and concept in this approach therefore the learner can keep his/her mental retaining in his active memory in a specific time and due to this, there will be more possibility that learner is able to make relation between visual and verbal retaining.

Teaching environmental issues in different ways has been the focus of researchers. And most of which have tried to evaluate the effect of different methods of knowledge, attitude and the performance of students, university students and in general participants of the survey. Whatever gained by this research is the more deep and effective methods based on the direct and active experience of students in learning. Getting students aware of their surrounding environmental issues as well as having them involved in teaching and learning activities, the approach applied here has tried to make them choose and provide images from environmental subjects. Also, using colour images with high quality along with their attendance at the image itself beside other subjects for teaching and meanwhile necessary visual sense for lexicons, concepts and new issues for learning are prepared; this situation is prepared for students to feel as one of the class participation parts using content related images for studying. Image-Concept chart applied in this survey which is made due to students cooperation, can be used as a urgent reference or cognitive glossary, making them add up concepts to their long-term memory and to be shared with their comprehension as well as writing, at the time they hear or see the concepts and issues (Kalhon, 1999). This is a general principle that although teaching quality is not the most important role, but it play a big role in forming the students' academic performance (Darling Hamond & Yangez, 2002). Enhance amount of learning and to lean well are the results of a good teaching. Students who learn well, improve strategies of learning well along with gaining teaching and being brought up on themselves. The approach used here helps students categorise correlated irrelevant concepts by improving their mental capability and based on main features of each category; they infer a unified title from them (Behrangi and Faraghi Waighan, 2008).

Underlying the main role in learning activities in one hand and the guiding and leading role of a teacher in another hand in this approach, students prepare a situation to make learning suitable for them in a realistic way.

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