

**EFFECTIVENESS OF A PROGRAM BASED ON
THE CONSTRUCTIVIST LEARNING FOR DEVELOPING
THE ENVIRONMENTAL VALUES AND THE SKILLS OF
THE PROBLEMS SOLVING IN SCIENCES FOR THE
PREPARATORY STAGE'S STUDENTS**

Submitted By

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A thesis submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Science

Department of Environmental Educational & Mass
Communication Science
Institute of Environmental Studies and Research
Ain Shams University

2014

APPROVAL SHEET

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ABSTRACT

This research aims to develop a program based on constructivist learning in science, and to measure the effectiveness of its application to develop of the environmental values and the problem-solving skills for the preparatory grades students, in order to achieve this aim, **the researcher has been used the following steps:**

- § The list was prepared for the environmental values , and in the light of it, the tool was designed to analyze the content of science books for preparatory stage to identify the availability of the environmental values in these books. The results showed that the science books did not address the environmental values enough.
- § The list was prepared for the problem-solving skills.
- § The both lists were used in the preparation of the program and two units of it (The atmosphere and its protection - Extinction and fossils) in the light of using constructivist learning strategies (five E's learning cycle - Cooperative Learning - Discussion –Role playing - Brainstorming) , for teaching to (40 students) from the second preparatory grade.
- § The scale consisted of (40 items) was designed to examine the effectiveness of teaching the units for developing of the environmental values of the students of study group .
- § The scale consisted of (25 items) was designed to examine the effectiveness of teaching the units for developing of the environmental problem-solving skills of the students of study group .
- § The both scales was applied on the students of study group before and after teaching the experimental units. **The results showed that :**

- § There were a statistically significant differences between averages degrees of students of study group before and after applying the suggested units in favor of post application at the environmental values scale as a whole and its dimensions (Respect for biodiversity - Living lightly - Aesthetic values - Respect for intergenerational equity - Respect for environmental human rights - Support of peace and environmental security- Preventive health).
- § There was no statistically significant difference between average degrees of students of study group before and after applying the suggested units at the environmental values scale of dimension (Sustainable consumption and production).
- § There were a statistically significant differences between averages degrees of students of study group before and after applying the suggested units in favor of post application at the problem-solving skills scale as a whole and its dimensions (Identifying the problem- Identifying the alternative solutions- Testing the validity of the solutions - Generalizing the results).
- § There was no statistically significant difference between average degrees of students of study group before and after applying the suggested units at the problem-solving skills scale of dimension (Collecting the data).
- § There was a positive correlation between grades of students of study group in the scale of environmental values and their grades in the scale of problem-solving skills.

Generally , the results indicated the effectiveness of using the constructivist program in science for developing the environmental values and the problem-solving skills of students.

The study recommended to apply the constructivist learning strategies for developing the environmental values and the problem-solving skills for the students.

SUMMARY

Man has exerted much effort to manage and make benefit from the environmental resources to live in welfare and comfort. That led to the emergence of environmental problems, which threaten the present and future generations. This problems can be solved and sustainable development achieved by highly-educated persons, who aware of necessary environmental information, and hold values promoting their respect of nature and rights of other individuals to take advantage of environmental resources, and have problem solving skills to plan for, cope with, and find solutions to the challenges facing their.

The development of environmental values and problem-solving skills for learners; requires the application of teaching strategies, that ensure the activity of student and effective role of teacher as a facilitator in the learning process.

According to the aforesaid , This study aims to develop a program based on constructivist learning in science, and to measure the effectiveness of its application to develop of the environmental values and problem-solving skills for the preparatory grade students, especially that environmental values is one of the components of Education for sustainable development, which play the main role for achieving the development that balance between the rights of the present and future generations of equal access to environmental resources. Also in the light of the increasing environmental problems which require the cooperation of all members of society to address them, to reduce their negative effects in the present time and the future.

Question of the Study:

According to the aforesaid , the study problem could be further elaborated by the following question:

"What is the effectiveness of a program Based on the constructivist learning for developing the Environmental values and the skills of the problems solving in Sciences for the preparatory Stage's students?"

In order to answer the above mentioned question, the following questions need to be answered:

- 1- What are the environmental values in science, which must be developed for the preparatory stage's students in the light of using the strategies of the constructivist learning?
- 2- What are the availability of those environmental values in the science curriculum for the preparatory stage ?
- 3- What are the problem-solving skills in science, which must be developed for the preparatory stage's students in the light of using the strategies of the constructional learning?
- 4- What is the form of a program based on strategies of the constructivist learning to develop the environmental values and problem-solving skills in the sciences for the preparatory stage's students?
- 5- What is the Effectiveness of the developed program in development of the environmental values for the preparatory stage's students?
- 6- What is the Effectiveness of the developed program in development of the problem-solving skills for the preparatory stage's students?
- 7- What is the correlation between grades of students of study group in the scale of environmental values and their grades in the scale of problem-solving skills?

Importance of the study:

- 1- The program of the study based on constructivist learning for developing environmental values and problem-solving skills among middle school students , may provide the educators with a set of principles for developing environmental education programs in accordance with the principles of constructivist learning.
- 2- The environmental values scale and the problem-solving skills scale can be used for preparing similar instruments or criteria for evaluating middle school student.

- 3- The study may result in the development of environmental values and problem-solving skills for some of the students of the study group.

Limits of the study:

- 1- The current study has been limited on two units (the atmosphere and its protection- extinction and fossils) , from the developed Program which is based on constructivist learning.
- 2- Student group is limited to some second class students of the Preparatory stage of basic education, Cairo Educational Elzayton Administration.
- 3- Measure the effectiveness of teaching units in the development of some of the environmental values of the students (respect for biodiversity - Living lightly - Aesthetic values - Respect for intergenerational equity - Respect for environmental human rights - Support of peace and environmental security - Preventive health, sustainable consumption and production), measured by the scale of environmental values.
- 4- Measure the effectiveness of teaching units in the development of some of the problem-solving skills of the students (Identifying the problem - Collecting the data - Identifying the alternative solutions- Testing the validity of the solutions - Generalizing the results) , measured by the scale of problem-solving skills .

Hypothesis of the Study:

- 1- There are a statistically significant differences between averages degrees of search group students before and after applying the suggested units in favor of post application at the environmental values scale as a whole and its dimensions.
- 2- There are a statistically significant differences between averages degrees of search group students before and after applying the suggested units in favor of post application at the problem-solving skills scale as a whole and its dimensions.

- 3-There is no correlation between grades of students of study group in the scale of environmental values and their grades in the scale of problem-solving skill.

Procedures of the Study

1-Identifying the theoretical frame including :

- Constructivist Learning.
- Education for Sustainable Development.
- Environmental Values.
- Problem-Solving Skills .
- Basis of Program Development.

2-Build developer program in science according to the following steps:

- Identify the environmental values that can be developed for preparatory school students through science.
- Analysis of the content of science books for the preparatory stage to identify the availability of the environmental values in these books, check the stability of the analysis process.
- Identify the problem-solving skills that can be developed for preparatory school students through science.
- Preparing of the general framework of the Developer Program based on constructivist learning included General objectives of the program , the organization of the general framework of the content and selected the teaching methods and educational activities and the instructional Aids And evaluation methods and then adjust the program.

3-Identify the effectiveness of the program developer in the development of some of the environmental values and problem-solving skills according to the following steps:

- Choose units from the program (and protection of the atmosphere) and (extinction and excavations) and developed them in terms of the objectives, content, teaching methods and (five E's learning cycle-Cooperative Learning -

Role-playing - Brainstorming - Discussion), activities and instructional Aids, evaluation methods and then adjust the units.

- designing The environmental value scale, consisted of (40 items) to examine the effectiveness of teaching the two units for developing of the environmental values of the students group.
- designing The problem-solving skills scale, consisted of (25 items) to examine the effectiveness of teaching the two units for developing of the problem-solving skills of the students group.
- Choosing students of study group .
- Pre application of scales
- Post application of scales

4-statistical treatments for data to extract the results and interpreted it.

5-Presenting Recommendations and proposals in the light of the study results.

Results :

- § There were a statistically significant differences between averages degrees of students of study group before and after applying the suggested units in favor of post application at the environmental values scale as a whole and its dimensions (Respect for biodiversity - Living lightly - Aesthetic values - Respect for intergenerational equity - Respect for environmental human rights - Support of peace and environmental security- Preventive health).
- § There was no statistically significant difference between average degrees of students of study group before and after applying the suggested units at the environmental values scale of dimension (Sustainable consumption and production).
- § There were a statistically significant differences between averages degrees of students of study group before and after applying the suggested units in favor of post application at the problem-solving skills scale as a whole

and its dimensions (Identifying the problem - Identifying the alternative solutions - Testing the validity of the solutions - Generalizing the results).

- § There was no statistically significant difference between average degrees of students of study group before and after applying the suggested units at the problem-solving skills scale of dimension (Collecting the data).
- § There was a positive correlation between grades of students of study group in the scale of environmental values and their grades in the scale of problem-solving skills.

Recommendations:

- § Experimenting the other units of the developer program which based on constructivist learning in the development of some of the environmental values and problem-solving skills to students.
- § Developing of methods of evaluating environmental values learning and problem-solving skills in accordance with the principles of constructivist learning strategies

الفصل الأول

مشكلة الدراسة وخطة دراستها

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مشكلة الدراسة وخطة دراستها

- مقدمة
- الإحساس بمشكلة الدراسة
- تحديد مشكلة الدراسة
- أهداف الدراسة
- أهمية الدراسة
- حدود الدراسة
- أدوات الدراسة
- منهج الدراسة
- فروض الدراسة
- إجراءات الدراسة
- مصطلحات الدراسة