THE OPINIONS OF PROSPECTIVE SCIENCE TEACHERS TOWARDS THE EFFECIENCY OF CONSTRUCTIVIST APPROACH CENTERED SCIENCE LABORATORY PRACTICES ON STUDENT MOTIVATION

Assoc. Prof. Dr. Murat DEMİRBAŞ

Kırıkkale University Education Faculty/Turkey *mdemirbas@kku.edu.tr*

Asst. Prof. Dr. Harun ÇELİK

Kırıkkale University Education Faculty/Turkey *hcelik@kku.edu.tr*

Asst. Prof. Dr. Mustafa BAYRAKCI

Sakarya University Education Faculty/Turkey *mustafabayrakci@hotmail.com*

TURKEY – NATIONAL SITUATION

- In education systems, it is expected that students have general knowledge about science, comprehend the characteristics of scientific knowledge and gain the process for obtaining scientific knowledge.

- Turkey has done some radical changes about science teaching programs in especially primary schools beginning from 2005.

TURKEY – NATIONAL SITUATION

- The name of course and the philosophy of the curriculum has been changed.
- The name of the science program applied in the primary schools has been changed as *“Science and Technology”*
- The curriculum has been designed on the basis of *“Constructivist Approach”.*

TURKEY – NATIONAL SITUATION

In the new curriculum

- Alternative measurement and evaluation activities were included,
- The topics were presented in a spiral structure,
- The concept teaching was focused, and
- Students' active learning was highlighted (MEB, 2005).

TURKEY – NATIONAL SITUATION

- In this regard, laboratory studies should include open-ended experiments based on constructivist approach and contribute to *students' attitudes and motivations*.

THE PURPOSE OF THE STUDY

What are the opinions of the science prospective teachers about the effects of constructivist centered laboratory practices;

- on understanding of nature of science?
- on development of academic success and scientific process skills?
- on effects of attitude and students' motivation?
- on creative and critical thinking skills?

METHOD

- Qualitative research model was used in the research.
- Case study technique was choosen to collect data.

STUDY GROUP

- 30 junior prospective teachers who haven’t had the constructivist centered laboratory activities and 30 senior prospective teachers who have had these activities were included in the study.

DATA COLLECTING TOOL

- 4 semi-structured questions were asked by the researchers in order to examine the change in the laboratory activities in which constructivist approach were applied during the process. These questions were determined according to the potential impacts of the laboratory activities.

DATA ANALYSIS

- The data obtained from the study were analyzed by content analysis technique.
- Content analysis technique is defined as a systematic replicable technique in which some words of a text are summarized with smaller content categories through some codification based on some certain rules (Büyüköztürk et al, 2008)

FINDINGS

- The opinions of the students who have had the constructivist centered laboratory activities and who haven’t had are presented in this part.

1. THE OPINIONS OF THE SCIENCE PROSPECTIVE TEACHERS ABOUT THE EFFECTS OF CONSTRUCTIVIST CENTERED LABORATORY ON UNDERSTANDING OF SCIENCE NATURE

Table 1: The Opinions of The Prospective Teachers About The Understanding of Science Nature

The Prospective Teachers Who Have Had The Constructivist Centered Laboratory Activities		**The Prospective Teachers Who Haven't Had The Constructivist Centered Laboratory Activities**	
Opinions	**f**	**Opinions**	**f**
1.It helps the aims and nature of the experiments.	5	**1. It helps to relate the cases associated with everyday life.**	19
2. It helps to relate to the environment.	10	2. It helps to get information about scientific literate.	6
3. It helps to understand the basis of humanity and life.	1	**3. It helps to extrapolate through observation and interpretation of result.**	12
4. It contributes to the understanding of science.	9		
5. It provides active participation in experiments.	7		
6. It contributes to understand the studies made by scientists.	2		
7. It contributes to meaningful learning.	5		
8. It presents the accessing ways to information.	5		
9. It encourages approaching to scientific studies.	1		

2. THE OPINIONS OF THE SCIENCE PROSPECTIVE TEACHERS ABOUT THE EFFECTS OF CONSTRUCTIVIST CENTERED LABORATORY ON THE DEVELOPMENT OF ACADEMIC SUCCESS AND SCIENTIFIC PROCESS SKILLS

Table 2: The Opinions of The Prospective Teachers About development of academic success and scientific process skills

The Prospective Teachers Who Have Had The Constructivist Centered Laboratory Activities		**The Prospective Teachers Who Haven't Had The Constructivist Centered Laboratory Activities**	
Opinions	**f**	**Opinions**	**f**
1. **It provides the development of scientific process skills.**	**23**	1. It contributes to learning by doing- living.	8
2. Academic success increases.	**13**	1. It contributes to active learning.	5
3. It provides a better understanding of scientific process skills.	3	1. It supports per-service development.	10
4. It contributes to individual and group success.	2	**1. It provides cognitive-affective-psychomotor development.**	16
5. It encourages to be a scientist.	4		
6. It contributes to the comprehension of topics.	4		
7. It provides to use knowledge in daily life.	4		
8. It helps to design different experiments.	2		
9. It contributes to meaningful learning.	8		

3. THE OPINIONS OF THE SCIENCE PROSPECTIVE TEACHERS ABOUT THE EFFECTS OF CONSTRUCTIVIST CENTERED LABORATORY ON THE DEVELOPMENT OF ATTITUDE AND MOTIVATION

Table 3: Prospective Teachers' Opinions about the development of attitude and motivation

The Prospective Teachers Who Have Had The Constructivist Centered Laboratory Activities		**The Prospective Teachers Who Haven't Had The Constructivist Centered Laboratory Activities**	
Opinions	**f**	**Opinions**	**f**
1. It increases attitude and motivation.	**24**	1. Providing active learning, it helps to increase emotional development.	11
2. Motivation increases through group study.	5	2. It provides to relate daily life.	8
3. Individual interaction is provided.	3	3. Providing a positive attitude, it helps to increase success.	18
4. It presents security to person.	4	4. It provides a motivation for the profession.	7
5. It develops student's self-competence.	4		
6. It creates thought for student achievement.	5		
7. It presents an enjoyable environment.	**6**		
8. It provides a motivation for the profession.	1		
9. It contributes to increase in success.	2		
10. It provides to relate daily life.	3		
11. It provides creative thinking.	2		

4. THE OPINIONS OF THE SCIENCE PROSPECTIVE TEACHERS ABOUT THE EFFECTS OF CONSTRUCTIVIST CENTERED LABORATORY ON THE PROVIDING OF CREATIVE AND CRITICAL THINKING

Table 4: The Opinions of The Prospective Teachers About the providing of creative and critical thinking

The Prospective Teachers Who Have Had The Constructivist Centered Laboratory Activities		**The Prospective Teachers Who Haven't Had The Constructivist Centered Laboratory Activities**	
Opinions	f	Opinions	f
1. It helps to design experiments for a topic.	9	1. It helps hypotheses establishment skill to develop.	5
2. Creative thinking develops.	**14**	**2. It gives a chance to develop individual learning through querying.**	**15**
3. Critical thinking develops.	**20**	**3. It helps to throw out ideas that can produce alternative solutions.**	**15**
4. Scientific attitude is presented.	1		
5. Different aspects develop.	2		
6. Th practices in daily life are learned.	1		
7. It is provided that topics are discussed with friends.	1		
8. The skill for suggestion making develops.	2		
9. Inquiry skill develops.	4		
10. Problem solving skill is gained.	1		

CONCLUSION AND COMMENTS

- The prospective teachers applying the constructivist practices state that they found the chance to test the scientific principles and concepts, and that their active participation in the experiments provided meaningful learning.
- When the evaluation of the results are made, it is indicated that a interactive learning environment effects students' motivation positively.
- ICT-Based teaching and learning materials on "Chemistry is All Around Network Portal" which are carefully selected according to the levels of students can be used for incrasing students' motivation.

CONCLUSION AND COMMENTS

- Moreover, it is thought that self-trust will increase; an enjoyable learning environment will be provided; success will be increased and creative thinking will develop.
- The participants think that producing new ideas and working together would be very useful for increasing the learners' motivation to learn scientific subjects.
- The international network by this project provides a useful oppurtunity to work together and discuss scientific subjects internationaly.

CONCLUSION AND COMMENTS

- In this case, it is understood that inquiry-based approaches is effective in the development of positive attitudes towards the lesson (Ergin, Kanlı ve Ünsal, 2008; Tessier, 2010, Özbek ve Dig., 2012).
- It is seen that constructivist centered learning environments have positive effects on the students in terms of providing conceptual change and meaningful learning.

Thank you for your attention…