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Views Of Biology Teacher Candidates About Context Based Approach

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Abstract

Biology is one of the courses that explain natural events. However, in literature there are some studies claiming that the association level of students between daily life events and biology subjects is very low. Context-based approach is described as the starting point for the development of scientific ideas in science teaching. In this approach real-life contexts are used to introduce concepts. The purpose of this study is to determine biology teacher candidates' view about context based approach. In this study the qualitative research method was used and the participants of this study consist of 14 volunteer senior teacher candidates from the division of biology education in Hacettepe University. A questionnaire was used as a data collection tool. The collected data was analyzed by using the content analysis method. In the light of the results, it is determined that the biology teacher candidates has some lack of knowledge about context based approach and it should be improved by using the context based approach activity in courses at university level so that the teachers candidates should be aware of with guides about context based approach.

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1. Introduction

Learning by doing is significant for the educational goals of relevancy of concepts with daily life, lasting of knowledge and active learning. In today's world student-centered methods and techniques which are based on the

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goal of effective learning are commonly used. One of such educational approaches is context based approach towards education. Research suggests that context based approach, like constructivist approach, is significant for efficient learning. On the other hand, the use of current educational approaches including context based approach leads to some problems in practice. Such problems include the incomplete knowledge about methods and techniques, inappropriate environment, lack of necessary equipment and poor student ability (Ramsden, 1992).

The context based approach towards learning has a significant role in combining scientific thinkings. This approach refers to the use of knowledge to solve or understand the daily life problems or events. It is significant in that it motivates students, requires responsibility and self-control and improves interest.

The context based approach towards learning was proposed to use in education by the York university educators in the 1980s. Later this approach was employed in the US, Germany, the Netherlands, and Israel. The approach was first introduced in Turkey in 2006 (Gilbert, 2006). The context based learning basically involves teachers, learners and life. Research indicates that the context based learning improve students' skills of making research, observation, scientific and critical thinking and connecting theory with practice. In addition it was found that those subjects delivered based on the context based approach towards learning the student motivation and student interest increased. Sozibilir et. al. argued that the basic goal in this approach is to introduce scientific concepts through examples from daily life (Sozibilir, Sadi, Kutu and Yıldırım, 2007). Choi and Johnsen (2005) argued that students can easily learn those scientific concepts which are related with daily life. Students reported that in the courses delivered based on the context based approach towards learning they had fun and the course attracted their interest (Dong, 2005; Bennett ve Lubben, 2006). However, this approach has also some negative dimensions: not all topics are eligible for delivering with it; it requires a significant portion of time; for some concepts finding examples from daily life is very demanding (Whitelegg and Parry, 1999).

The aim of the study is to identify and describe the views of the pre-service biology teachers concerning the context based educational approach. They were all senior undergraduate students.

2. Method

This study was designed as qualitative research with the aim of identifying and describing the views of the pre-service biology teachers concerning the context based educational approach.

2.1. Research group

The participants of the study were fourteen student biology teachers who were attending the department of biology education during the academic year of 2014-2015. They voluntarily participated in the study.

2.2. Data collection tools and data analysis

The data of the study was a form which included four open-ended items in regard to the views of the pre-service biology teachers concerning the context based educational approach. The items were reviewed by field specialists before the implementation. The data obtained were analysed through content analysis.

3. Findings

The following section includes the answers of the participants to four open-ended items.

3.1. Answers to the questions of what the context based approach towards learning is

During the interviews the participants first asked to define the context based approach towards learning. Some examples from their answers are given as follows:

“The context based approach towards learning refers to doing by learning rather than delivering theoretical knowledge. It aims at connecting theoretical knowledge with daily life through concrete examples from the nearest environment or through students' analysis of the examples related to the concepts at hand.”

“In the context based approach towards learning knowledge is taught through connections and association. Knowledge or concepts to be learned become easy to acquire through their connection with familiar words.”

Five of the participants answered to this question that the context based approach towards learning is used to make theoretical knowledge much more concrete. Six of them it provides learning by doing.

3.2. Answers to the questions of advantages and disadvantages of the context based approach towards learning

During the interviews the participants secondly asked to state the advantages and disadvantages of the context based approach towards learning. The following is the examples from their answers to this question:

“The context based approach towards learning provides knowledge which lasts for a long time since it is used in practice.”

“The context based approach towards learning facilitates student learning, improves student interest in course, reinforces the topics delivered and provides the students with the opportunity to connect topics with examples from daily life.”

“If students become aware of the fact that they will use their learning in daily life they better listen to the teacher and focus on the course. They also like the course.”

“The context based approach towards learning helps in developing coordination in daily life and in educational experiences. It increases interpersonal communication and harmony in daily life..”

In addition, six student teachers reported that the context based approach towards learning has the advantage of creating long lasting learning. Two of them stated that its advantage is its being instructive and three participants stated that the context based approach towards learning facilitates the comprehension of the material to be learned. One participant reported that it provides students with the opportunity to make questioning.

Concerning the disadvantages of the context based approach towards learning the participants reported various views. There were also participants who stated that this approach has no disadvantage at all. Some of the answers of the participants are given as follows:

“Given that the context based approach towards learning requires longer periods of time class hours may not be enough. It seems to be the mere disadvantage of the approach. for me it does not so much...”

“I do not think that the context based approach towards learning does not have any disadvantage. If there are disadvantages of it, these are not so significant.”

“There are some topics which cannot be taught through this approach. We may not give examples about all topics. In addition, this approach may not work for all students.”

“When a significant topic is connected with simpler ones, its significance may not be recognized. Thus, the context should also be carefully chosen.”

“When inappropriate contexts are employed there may occur concept confusions.”

“This approach may lead to the fact that students knowledge is limited to a certain field.”

“If in all courses connecting something with another thing is always used then it becomes an expectation of students. In other words, whenever they cannot understand any topic or whenever they come across an abstract concept they tend to make a connection about it. It may negatively affect students’ developmental or cognitive processes.”

There were also three student biology teachers who did not answer to this question.

3.3. Statements about the desired contexts to be used in the biology course

In the interviews the participants were also asked to indicate which contexts should be covered in the biology course and to give examples for such desired contexts. The following statements exemplify their views in this regard.

“... for instance while studying topics such as enzymes students may be asked to bring a piece of meat from their home to make experiments with it and then to discuss the results of their experiments. In this way the topic is connected with daily life and becomes visual and long lasting.”

“In course it may be stated that plants needs water to live. Students may bring parsley and put it into water. They will see that parsley will liven up.”

“While studying yeast students may visit bakery or they may bake bread at home with their family members. ...while studying the relaxing of muscles rubber bands may be used to show this process.”

“While studying bacteria it may be stated that the reason for heating and continuous mixing during the

fermentation of yogurt, the fermentation of beer, or making a pudding or vinegar is to make it homogenized.”

The other participants stated only their desired context without giving any example. These stated contexts include recycling, organs, vitamins, nutrition, making pasteurized milk and yogurt.

3.4. Statements about the examples for context

Then the participants were asked to select a topic from biology and to develop an example context for it. The following is the related statements of the participants.

“In biology the topic of disinfection may be studied in relation to both laboratory work and health-care. Instead of using regular lecturing to study this topic students may be asked to search for disinfection and then, to make small-size experiments at their home. Such experimental experience may include the differences between washing hands with only water and washing hands with water and soap and between washing hands with hot water and washing hands with cold water. Then in the classroom the groups of students may be asked to answer the questions about disinfection. In this way students become active participants of their learning and can access information themselves.

“While studying fermentation following the lecture students may visit related workplaces to see the procedure. Then they may be asked to make yogurt at their home and they use their learning in a daily activity (milk or yogurt factories may be visited).”

“For instance, while studying brain we may make a connection between its shape and that of walnuts to make the former more concrete. In this way students interest increases and focuses on the topic.”

Of the participants, three student teachers did not provide an example for context. There were two student teachers who gave their answer through drawings.

4. Results And Discussion

In the educational program for the biology course developed by the ministry of national education it is stated that producing individuals with biology literacy is among the basic goals of the course. Those individuals who comprehend the nature of science can employ their biology knowledge in solving the daily problems (MEB TTK, 2013).

The pre-service teachers participated in the study defined the context based approach towards learning as learning by doing, reviewing knowledge through examples from the nearest environment, learning through connections and associations, and developing reasonable and associative connections among topics and concepts. Research suggests that the context based approach towards learning is based on the development of contexts in which examples from daily life are used and that students learning occur through experiences in such contexts. On the other hand, it was observed that some of the participants confused the context based approach towards learning with other learning approaches such as student centered approach and inquiry-based learning approach (Choi and Johnson, 2005; Bennett and Lubben, 2006; Ramsden, 1992).

The advantages of the context based approach towards learning reported by the participants were found to be as follows: being instructive and producing long lasting learning, coordinating daily life and educational experiences, increasing harmony in life and student interest, facilitating learning, and students better focus on the course. The disadvantages of the approach stated by the participants were found to be limited class hours, nonapplicability of the approach to all topics or concepts, likely decrease of the significance of some topics due to using connections, student differences in regard to the advantages of the approach, possible concept confusions due to the use of improper contexts and negative effects of making connection students developmental and cognitive processes. One of the participants stated that the context based approach towards learning has no disadvantage. Research suggests that in science courses delivered through the context based approach towards learning the student achievement, student interest and student motivation significantly increased. It is very important that examples to be used and content should be consistent and topics should be related to daily life. Finkelstein claimed that the context based approach towards learning also improves the skills of cognitive process (Finkelstein, 2005). The advantages of the approach stated by the participants are regarded as reasonable and sufficient explanation. However, in regard to the disadvantages some of the participants' answers seem to be a result of their insufficient information about the approach. Such disadvantageous points include the following: likely decrease of the significance of some topics due to using connections, possible concept confusions due to the use of improper contexts, and negative effects of

making connection students developmental and cognitive processes.

Concerning desired contexts to be covered in the biology course the participants suggested the following: bringing a piece of meat while studying enzymes to make it visual and related to daily life, putting parsley into a glass full of water to see that it will liven up, visiting bakery while studying yeasts, and using rubber bands to explain the movement of muscles. Although the participants were asked to provide the reasons for their desired contexts, none of them gave such reasons. On the other hand, some participants did not specify the related examples for the desired context and just reported that examples should be taken from daily life. Such answers may show that they did not have a full understanding about the approach.

The participants also asked to provide a context for a topic they selected from the field of biology. Of the participants only the answers of two student teachers were proper and sufficient for the context based approach towards learning (disinfection-soup, muscles-rubber bands). The others were not sufficient and proper for the approach. The other two student teachers answered this question through drawings. These findings suggest that although the participants were aware of the fact that the context based approach towards learning is related to daily life and of its significance, they did not have necessary and sufficient information about the approach. In order to produce individuals who fully understand the nature of science student teachers should comprehend the context based approach towards learning during their teacher training program.

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