



A STUDY ON 7TH GRADE STUDENTS' MISCONCEPTIONS ON THE UNIT OF "SYSTEMS OF OUR BODY"

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Abstract

The aim of this study was to determine the misconceptions of 7th grade students about the unit of "Systems of Our Body" in the year 2010-2011. For this purpose, open questions and interviews were directed at 42 7th grade students. As a result of the analysis of data obtained, it was determined that the primary school students have various misconceptions about systems, organs and hormones. Some of the misconceptions; "anus is a digestive system organ", "driving bicycle is not reflex", "insulin increases blood sugar" and "diabetes causes from eating too much sugar". Some suggestions were recommended by the help of the findings of this study.

Keywords: Misconceptions, Primary Education, Science and Technology Textbooks, Systems of Our Body

INTRODUCTION

Subjects of Science and Technology courses consist of various concepts and the relations among them. Misconceptions, which are defined as explaining a concept in a different form than the scientists could accept, are to be avoided by means of meaningful learning (Aydın, Balım; 2009). Before science lessons students have some beliefs about science. In science literature these beliefs are called as, "pre-concepts", "alternative conceptions", "misconceptions", "children's scientific instincts", "children's science", "general sense concepts", "spontaneous knowledge" (Gülçiçek, Yağbasan; 2004). The basic reasons of misconceptions can be arranged as; student factor; (lack of pre-knowledge, prejudices, lack of motivation and interest, using daily talking language in scientific subjects), teacher factor; (insufficient concept knowledge, wrong classifications of the concepts, overrate the details.) and text books factor; (teaching order, containing too much mistake and wrong knowledge, lack of shapes and examples, the lack of the connection of titles) (Aşçı, Özkan, Tekkaya, 2001).

The probability of changing misconceptions in further years decreases because of the difficulty of determining the misconceptions of students' when it occurs (Eyidoğan, Güneysu; 2002). In our

country some researches were made to determine misconceptions in science in last years (Eryılmaz, Tatlı, 1999; Koray, Bal, 2002; Cardak, 2009; Bahar, 2003).

The aim of this study is to determine the 7th grade students' misconceptions about the unit of "Systems of Our Body".

METHOD

For determining and analyzing misconceptions concept maps, concept tests, open ended questions, negotiations and combinations of these method can be used (Schmidt, 1997).

This research was carried out in 2010 - 2011 academic year among 42 7th grade students attending Hüseyin Avni Ateşoğlu primary school in Izmir. 21 of the participants were female and 21 were male. The students participating in the study were given a form which contains open-ended questions about the unit of "Systems of Our Body". During the interview, questions parallel with the misconceptions, such as why and how were directed at the students. These questions included, for example: "you state that diabetes causes eating too much sugar; why? And "you state that anus is digestive system organ; why? The collected data from the students was analyzed by researcher. The misconceptions gathered from the answers to the open questions were separated into five different sub-units: digestive system, urinary system, nervous system, hormone system and sense organs.

FINDINGS

When the answers which were given to open ended questions about the unit "Systems of Our Body" were analyzed, it was found that the students have important problems about the unit. The misconceptions which were determined by the answers of the open ended questions is shown as below.

Table 1. Students' misconceptions, numbers and frequencies about the unit of "systems of our body"

Sub-unit	Misconception	f	%
Digestive system	Spicy foods can cause ulcers	18	42
	Liver can digest fat	14	33
	Fruits are always healthy food	32	76
	Sugar causes tooth decay	36	85
	Some foods that contain water (e.g. juice, tea, milk, vegetables) also keeps a person hydrated	24	57
	Stomach is most of the area below the belt	18	42
Urinary system	Anus is a digestive system organ	16	38

	Large intestine is the last organ of urinary system	20	47
	Excessive water are thrown by kidneys	24	57
Nervous system	Reflex happens after an unexpected event	30	71
	Driving bicycle is not reflex	33	78
	People use only ten percent of their brains	36	85
	We can provide our equilibrium by cerebellum	22	52
Hormone system	Insulin increases blood sugar	26	61
	Diabetes is caused by eating too much sugar	39	92
	Glucagon decreases blood sugar	20	47
Sense organs	Smelling cologne kills harmful bacteria	27	64
	Light goes to the brain	16	38
	Cologne is good for eyes because it causes tear and cleans eyes	29	69
	Lemon juice is good for bright eye	30	71

As seen at the table 1 students have major misconceptions about systems. The most seen misconceptions are "Diabetes is caused by eating too much sugar", "Spicy food can cause ulcers", "Reflex happens after an unexpected event" and "People use only ten percent of their brains". In fact diabetes is a hereditary illness. It derives from the lack of the insulin. Another wrong belief is ulcers causes from spicy foods. In fact it causes from bacteria. Reflex is an unlearned or instinctive response to a stimulus (<http://www.thefreedictionary.com/reflex>). And people use more than ten percent of their brains (http://www.csicop.org/si/show/the_ten-percent_myth)

DISCUSSION

To prevent the misconceptions which hinder learning these advices could be suggested: from the beginning of the primary education students conceptual changes must be searched and the reasons of learning difficulties and misconceptions should be determined. Before the unit the misconceptions about that unit must be investigated and prevent the occurring of these misconceptions some worksheets and activities should be designed. Science and technology text books must be examined carefully and the texts which can cause misconceptions should be eliminated.

As seen table 7th grade students have a lot of misconceptions about the "systems of our body" unit. These misconceptions can be originated from the learning environment (family, backgrounds etc) or they can be derived from the mistakes which are included in text books. The data's which

gained in this search get along with the results of other studies. (Koray, Bal, 2002; Dikmenli, Çardak, Turkmen, 2002).

CONCLUSION

At the end of the study it was determined that students have some understanding difficulties and develop some alternative conceptions at the unit of "systems of our body" which is one of the difficult units in science lessons. Consequently it was seen that students have important t misconceptions at diabetes, missions of the organs, the shape and place of the organs and the health of the organs generally.

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