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THE EFFECT OF USE CONCEPT CARTOONS ATTITUDES OF FIRST GRADE ELEMENTARY STUDENTS TOWARDS SCIENCE AND TECHNOLOGY COURSE

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Abstract

The purpose of this study is to specify the effect of the use of concept cartoons in teaching science and technology in the First Grade of Elementary Education attitudes of elementary students towards the science and technology course. Pre-test and post-test, and a quasi-experimental design without control group were utilized in study. The research was conducted with the fourth and fifth graders in the AytenŞabanDiri and UlubatlıHasan elementary schools (76 students) located in the Ankara province in spring term of the 2009–2010 academic year. study,has15-item 5 point likert "Attitude Scale for Science" prepared by Geban et al., (1994) was used as pre-test and post-test. At the end of the study a significant difference was determined in favor of post-test scores between pre-test and post-test scores of the attitude of elementary education students towards the science course.

Keywords:science and technology education, concept cartoons, attitude

1.Introduction

In order to make science education more efficient, which aims to make individual acquire behaviors such as conducting research, asking questions, producing views, thinking of ways on how to obtain scientific knowledge, different theories, techniques, and methods are utilized and new ones are added to these day by day (Süzen, 2008). One of these theories called the constructive learning theory (constructivism), which is one of the most advocated theories in recent years.

The Science and Technology Course is the course where the constructive approach is applied in the most convenient manner, in other words, it is the course where interdisciplinary knowledge is integrated the most and the knowledge is transferred to daily life cases the most. In this course it is aimed that children discuss and examine the

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environment and the world, in which they live, in a scientific manner. Their easy adaptation to life depends on them observing the environment they live in a good manner and learning the ways to obtain results by establishing cause and effect relations among events as much as possible. In this sense, in the Science course the students must gain the habit of thinking objectively and making correct decisions in the face of events and situations by examining their environments with scientific methods and this ensures that they raise themselves as useful individuals to their environments, families, and themselves (Kaptan, 1999).

When objectives of curriculum of Science and Technology course for the year 2004 are examined, it is observed that training individuals that are investigative, inquisitive, curious, science and technology literate, have scientific process problem solving skills, know the means of obtaining knowledge, have critical and creative thinking skills has been set as an objective. By means of the rearrangement of the science curriculum on the basis of constructive approach, works on visual aids that ensure the active participation of students in lessons in learning environments increased. One of the said aids is concept cartoons (Balım, İnel, and Evrekli, 2008: 192).
Concept cartoons are in a constructionally different format from known cartoons and although they do not contain humorous and exaggerated elements, the depiction of events and characters through drawings attribute them the quality of cartoons (Uğurel and Moralı,2006). Concept cartoons introduced in the literature by Brenda Keogh and Stuart Naylor in the 1990's and take the constructive approach as a basis do not use humor or satire. Generally they are in the form of a pictorial expression of three or more characters discussing a subject. In this discussion each character defends a different view. One of the views presented in the debate represents a way of thinking that is accepted as scientifically true and the other ones represent ways of thinking that are scientifically untrue but constituted specifically by the students (Akamca and Hamurcu, 2009). As Kabapınar (2005) states, giving names to characters in cartoons will provide convenience for both the student and the teacher.

Concept cartoons lead the students to reasoning and ensure the active participation of students in the learning process and establish a strong connection between the assessment and the learning that follows this (Keogh and Naylor, 2009). Long and Marson (2003) summarized the benefits of concept cartoons in their studies they performed regarding concept cartoons in the following manner; they help students ask their own questions; they provide contribution to the development of students' views; they challenge false views of students' and develop their views; they adapt scientific views into life; they draw the attention of students and increase the motivation; they develop language and literature. Concept cartoons present many opportunities to learners to enhance the learning and motivation at many levels. Also in the literature it is observed that concept cartoons are used in teaching science and technology and in different conditions for the purpose of assessing the comprehension levels of scientific subjects of prospective teachers (Chin and Teou, 2008; Akt: Dalacosta, KamariotakiPaparrigopoulou, Palyvos and Spyrellis, 2009). In addition, it is stated that concept cartoons within the educational activities will provide contribution to the development problem solving, critical thinking, production of scientific thought skills of students and that they will be helpful for the concentration of the students by making the subject more interesting (Keogh and Naylor, 1999).

In this study, determining the effect of the use of concept cartoons in science courses on the attitudes of elementary students towards the science course has been set as an objective. When the literature on the matter was reviewed, it was determined that the attitudes towards science also influenced learning (Weiss, 1987; Koballa, Crawley and Shringley, 1990; IAEP, 1992; Linn, 1992; Simpson et al., 1994; Akt: Serin, Kesercioğlu, Saracaloğlu and Serin, 2003).In various conducted studies, the concept of attitude was defined in different ways. According to Smith (1968), the attitude is a tendency, which is attributed to an individual and constitutes the individual's views, feelings, and behaviors on a psychological object in a regular manner. Tezbaşaran (1997) defines attitude as "the learnt tendency to demonstrate positive or negative reactions against a certain object, conditions, organization, concept or other people." When it was considered as an attitude towards the science course, it may be defined as "the individuals' positive or negative assessments on lessons, tasks, laboratory and professions regarding the science course" (Çelikkaleli and Akbaş, 2007: 22).

As the attitudes of children are formed at an early age, elementary education period is quite important in developing positive attitudes towards science (Jewett, 1996). It should be borne in mind that especially the curious and inquisitive nature of children attending elementary school is at its highest level and that the science and technology course ranks first in terms of asking questions and issues that they are extremely curious about to learn. Therefore, one of the basic objectives of education is to make elementary students like science and ensure permanent continuation of their curiosities and desires (MEB-UNISEF, 1995; Akt: Tereci, Aydın, Orbay, 2012).

As the class level progresses, depending on the time negative attitude development in students towards the science course is a common problem. Use of ineffective educational methods and techniques, characterization of science course as a difficult course, and factors regarding familial or social life have been pointed out as among the basic reasons of this problem (Weinburgh, 1995; Greenfield, 1998; Osborne,Simon & Collins, 2003; Akt: Tereci, Aydın, Orbay, 2012). In this regard, the issue of whether or not the education performed through concept cartoons as a visual aid on the basis of constructive approach creates a difference over the attitude towards the science course confronts us as a subject that needs to be researched.

2.Problem Sentence

Does the use of concept cartoons create a significant difference on the attitudes of elementary education towards the science course in Science and Technology Teaching in First Grade Elementary Education?

3.Methodology

Pre-test and post-test, and a quasi-experimental design without a control group were utilized in the study. The study was conducted with the fourth and fifth graders in AytenŞabanDiri and UlubatlıHasan elementary schools (60 students) located in the Ankara province in the spring term of the 2009–2010 academic year. In the study the 15-item 5 pointlikert "Attitude Scale for Science" prepared by Geban et al., (1994) was used. The "Attitude Scale for Science" was applied to elementary students at the beginning of the study. During the study prospective teachers undergoing internship at the application schools used their own concept cartoons they developed themselves in the science and technology lessons for a whole term with the knowledge of the researchers. At the end of the application the "Attitude Scale for Science" was applied again as a post-test to elementary students. The data were analyzed by using the "SPSS for MS WINDOWS 15.0" package program. In the analysis of data obtained in the study, the t-test was referred to for the dependent groups within the quantitative research method.

4.Findings and discussion

In the study an answer was sought for whether or not the education performed with the use of concept cartoons created a significant difference over the attitudes of first grade elementary students towards the science course. For this purpose a t-test analysis was performed for the dependent groups among the attitude scores of first grade elementary students towards the science course. The results of analysis have been provided in Table 3.1.

Table 4. 1. "t" test results for the dependent groups regarding the attitudes of elementary students towards the science course

	Test Group	N	$\overline{X}$	Ss	t	p
Attitude	Pre-test	60	23.87	7.20	2.77	.007
	Post-test	60	29.03	9.81		

A significant difference was determined in favor of post-test scores between the pre-test and post-test scores of the attitudes of elementary students towards the science course (t= .007 p< .05). It may be said that the attitudes of first grade elementary students towards the science course develop positively.

This finding demonstrates parallelism with the views of prospective teachers and elementary students on concept cartoons in the study of Keogh and Naylor (2000) titled "Teacher and Learning in Science Using ConceptCartoons: Why Dennis Wants to Stay in at Playtime?" Keogh and Naylor emphasize especially the positive effects of the use of concept cartoons in their studies. The views of teachers participating in the study are as follows: "*They are really very helpful in revealing children's views; they are very successful to help children explain their own views especially the children who refrain from explaining their own views, it is observed that the children participate in lessons actively and that they are highly-motivated."* Similarly, it also shows parallelism with the finding of "increasing interest in lessons" obtained in Özalp's (2006) study and with the findings that the cartoons affect learning positively and provide motivation, and make the lesson more interesting in Cengizhan's (2011) research. Again similarly, (Oluk and Özalp, 2007) in their studies concluded that concept cartoons increased the interest of students in science courses and that they made their learning easier and that they made the lessons more entertaining. This judgment was also supported by student feedbacks: "*To tell you the truth, I usually do not like science courses but this time it was quite fine...", "I liked the lesson very much with the contributions of cartoons, they make the boring lesson more entertaining and the pictures were funny…", "I started to like this", "This is a different method and we applied this for the first time; it was really so entertaining and we never got bored of the lesson and it was really great pleasure for me to work with my friends…*

Kuşakçı (2007), who examined the effect of concept cartoons on attitudes, had interviews with the teachers and the students in his study regarding the use of concept cartoons in science education. As a result of quantitative analyses, a significant difference between the attitudes of students in the test group and that of students in the control group for the science course was not observed; however, the teachers and students in the test group stated positive views on concept cartoons. The teacher in the test group stated that the cartoons were useful for the students. The students expressed that they liked the lessons covered through concept cartoons more and that they learned easily and what they learnt were permanent.

5. Recommendations

- Whether or not a change occurs in the attitudes of students towards science may be studies more thoroughly through discussions with parents.
- Studies reviewing the achievements and attitudes of students towards science may be conducted (Serin, Kesercioğlu, Saracaloğlu, and Serin, 2003).
- As Kabapınar (2005) stated, giving names to the characters in cartoons will provide convenience for both teacher and the student. Hanging the concept cartoons over the boards not only in the classroom but also out of it may lead all students to reasoning.
- The effect of concept cartoons on different variables in science education may be studies.
- The effect of concept cartoons on the attitudes may also be studies in second grade elementary education. How the attitude changes according to progressive class levels may be examined.
- In order to develop positive attitudes for science, educational methods and techniques on the basis of constructivism may be applied.

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