Analysis of Science and Technology Teachers’ Views about Science Education Process in Terms of 5E Model

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SYNOPSIS

INTRODUCTION

Elementary School Science and Technology Curriculum Class Education Program was started to be applied on 2004-2005 academic year and it was based on constructivist approach. Constructivist learning approach is based on the idea of Ausubel and was developed by Wittrock; the motto of this approach is “The most important factor that affects learning is the present knowledge of student (Ausubel, 1968, p.4)”. Constructivist learning approach tries to explain learning and create distinctive knowledge and demands that students use their present knowledge in order to achieve new information (Appleton, 1997; Hand & Treagust, 1991; Turgut, Baker, Cunningham, & Piburn, 1997). The basis of the constructivist approach is the view that individuals construct their own knowledge instead of transferring an individual’s knowledge directly to another. Science and Technology Education Program’s objects and visions gave new roles to teachers. The most of the teachers have been educating the students for years had carried out programs that include behavioral approach’s goals; they met with the constructivist approach 6-7 years ago. The upbringing of teachers can cause them have some problems while changing from traditional teacher roles to constructivist teacher roles. Overcoming these problems and becoming accustomed to the new approach requires a radical paradigm change. On the other hand, it requires teachers to leave many practices and adopt new practices. Students can take responsibility in their own learning process only through constructivist strategies applied by educators (Özden, 2003). In this sense, internalization level of the constructivist approach by science and technology teachers is important.
PURPOSE OF THE STUDY

The aim of this study is to determine the beliefs of science and technology teachers and to identify to what extent these beliefs correspond to the constructivist approach’s 5E model.

METHODOLOGY

a- Design of the Research: Quantitative research approach was employed in the study. Techniques of quantitative research were used as they ensure sensitivity to the environment, and because the researcher has a participatory role, and these techniques have a holistic approach. In addition they; ensure revealing perceptions, have flexibility in research design and have an inductive analysis (Yıldırım & Şimşek, 2005).

b- Participators: 14 science and technology teachers who were volunteers to participate in the research process were selected from elementary schools in Trabzon, Provincial Directorate for National Education. Names of the participants weren’t used due to research ethics. Hence, participant teachers were encoded as Ö1, Ö2, Ö3, Ö4, ..........Ö14.

c- Data Collection: Semi-structured interview technique was employed in this study. Firstly 15 questions were determined by researchers, but after taking the views of different researchers, they were reduced to 10 questions. After the last forms of the questions were attained they were analyzed by 3 professionals. The interviews were conducted in the schools where participants had been working.

d- Analysis of the Data: Content and descriptive analyses were used for analyzing data. Content analysis is described as a systematic and renewable method which summarizes a text using smaller content categories with encodings based on specific rules (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2008).

FINDINGS

It was seen that participants’ learning beliefs were different especially in exploring and evaluation stages. It can be said that teachers’ beliefs were in parallel with the introduction and explanation stages of 5E model. Teachers had some difficulties in carrying out the different features in 5E model’s stages. It was determined that in the introduction stage, only %35,7 of the teachers carried out the principle of “Students are ensured to question their own knowledge”. This ratio is rather low. On the other hand, while in exploration stage, %35,7 of teachers adopted the principle of “guiding”; in explanation stage, only %28,5 of the teachers carried out the principle of “students share and discuss what they learn from their personal experiences”. Science and technology teachers participated in the study had some difficulties in the principle of elaboration stage which says that “He gives ideas about the fact that there may be some other alternative explanations” and in the principle of evaluation stage which says that “It allows students evaluate their friends what they personally learn”.

DISCUSSION and CONCLUSION

It was determined that the principles of exploration and elaboration stages didn’t correspond to the science teaching beliefs of the teachers that participated in the study. When the reasons of this were researched, most of the teachers expressed that they were in raised with an education that is based on behavioral approach. These participants stated ideas that were parallel with the principle of “a student is taught how he learns”. Some teachers explained that the reason why they were active in exploring section and not guiding the students was because students’ knowledge level was low. Some participants said that they had time problem as there were too many topics to teach; this is why they took an active role in
this stage and solved this problem. It was seen that teachers were thinking as if the elaboration stage was based on giving examples from their daily life and connecting the topic with daily life, so they ignored the other features of this stage. But in this stage, students should relate what they learn with the other disciplines and concepts and apply them in new situations. 28.5 of teachers applied this feature of the stage in their classes (see. Table 7). The reasons of this low ratio were teachers who didn’t want to take responsibilities and didn’t have the wish to improve themselves. On the other hand, at the end of the interviews with teachers, it was determined that teachers were thinking that it was difficult to prepare activities for practicing the principles of elaboration stage. This result was in parallel with the results of the study by Nas (2008).

REFERENCES