WESTERN ANATOLIA
JOURNAL OF EDUCATIONAL SCIENCE
http://web.deu.edu.tr/baed
Dokuz Eylul University Institute of Educational Sciences

ISSN 1308 – 8971

Special Issue: Selected papers presented at WCNTSE

USE OF SCIENCE LOGS IN DETERMINING THE RELATION BETWEEN SCIENCE AND TECHNOLOGY AND DAILY LIFE

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Abstract

In this study, science logs were used in order to investigate students' skills to relate science and daily life. The purpose of the study was to determine what kind of relations students can generally form between science and daily life without choosing any subject from science and technology curriculum and to specify their opinions about explaining these relations through science logs. Students' science log writing practice lasted for 3 weeks. The study group, which was determined through convenient sampling-one of purposeful sampling methods- comprised of 12 6th grade students in Selçuklu district of Konya. The study was designed in a purely qualitative fashion for all steps of sample selection, data collection and analysis. The technique that was preferred in the data collected through science logs were correspondence. Students' opinions about relating science to daily life by using science logs were taken through semi-structured interviews. For analyzing the study data, descriptive analysis was performed through NVivo 8 Data Analysis Program. According to the study results, it was determined that students could generally identify the subjects related to science but that they had difficulty forming a relation between what they came across and science. Students stated that they had pleasure in writing science logs and that although in the first couple of days they had difficulty in understanding whether what they came across was related or not, they liked it later on.

Keywords: Science logs, science and technology, daily life

INTRODUCTION

Science logs are instruments which provide students to reflect their experiences in the class, also which has writing process and communication together (Ruiz-Primo, Li, Ayala & Shavelson, 2004; Rivard, 1994). While science logs help students to construct information (Hanrahan, 1999), they can be used as an instrument, for learning, teaching and evaluating (Shepardson & Britsch, 1997).

Students can explain science in their own words and freely with science logs, so it is provided students to see science as a part of their daily experiences. In this direction, science logs give an opportunity for evaluating students in many subjects as their perspective towards science, information they gained in formal and informal educational environments (Ajello, 2000). In other words, science logs not only provide information about experiences in class, they also look like logs which real scientists had used while exploring the world. By writing these logs, students will achieve actual scientific thinking while they are carrying on their researches (Hargrove & Nesbit, 2003).

When other studies related to science logs were viewed, it was seen that they were about using science logs in primary school and experiences during application (Shepardson & Britsch, 1997), evaluating the contributions of writing science logs on science and technology course to students (Avcı Erduran, 2008), determining teacher candidates' explanations about their observations during school experiences (Şahin, 2009; Ekiz,2006), and using science logs as self evaluation instrument (Srimavin & Darasawang, 2004).

As distinct from literature, science logs were used for investigating students' ability of relating science and daily life, in this study. It was aimed that, without selecting a topic from science and technology curriculum, determining how students relate science and daily life and their views about telling these relations with science logs.

METHOD

In this study, students were wanted to write events they encountered in daily life, which they thought it was related to science and explain its relation with science. This study is a case study, which logs of students and their views about explaining daily life with science in science logs were investigated. Case study is a research approach that a phenomenon's one or more sample is studied deeply (Given, 2008).

Study Group

The study group of the research consists of 6th grade 12 students from Konya's Selçuklu town and this group was determined by convenience sampling which is a purposeful sampling method. Convenience sampling accelerates and brings practicability to research (Yıldırım & Şimşek, 2006). At first 20 students included to study, but when students' logs were collected, it was determined that some of them didn't contain the entire of 3 week period. When these students removed from the working group, study's working group decreased to 12 students.

Data Collection

Preferred method is correspondence for gathered data of science logs. Before the research started, students were educated about writing logs in 2 lessons. Students were wanted to write logs for 3 weeks period. And students' views about explaining relationship between daily life and science in science logs were taken by semi-structured interviews. For semi-structured interviews views taken from an expert who has PhD in science education and 3 experts who are doing PhD in science education field and 5 questions were prepared. Questions in this study include student views about keeping science diary and relating daily life and science and technology by keeping science diary.

Data Analysis

Content analyzing and constant comparison methods were used together for analyzing study's data gained by science logs and data obtained from semi-structured interviews. Students' logs and semi-structured interviews were transferred to electronic media, coded and themes were formed by identifying common aspects. After both data gathered from science logs and semi-structured interviews were coded by two different researchers, final form of resulting code and theme list was given. Coherence of codes which researchers used separately was determined by signing as "Agreement" or "Disagreement". In this way reliability of data analysis was estimated with (Number of agreements / (Total Number of Agreements + Disagreements)) x 100 formula (Miles & Huberman, 1994). Average reliability between coders determined as %86 for coding about science logs, %83 for coding about semi-structured interviews.

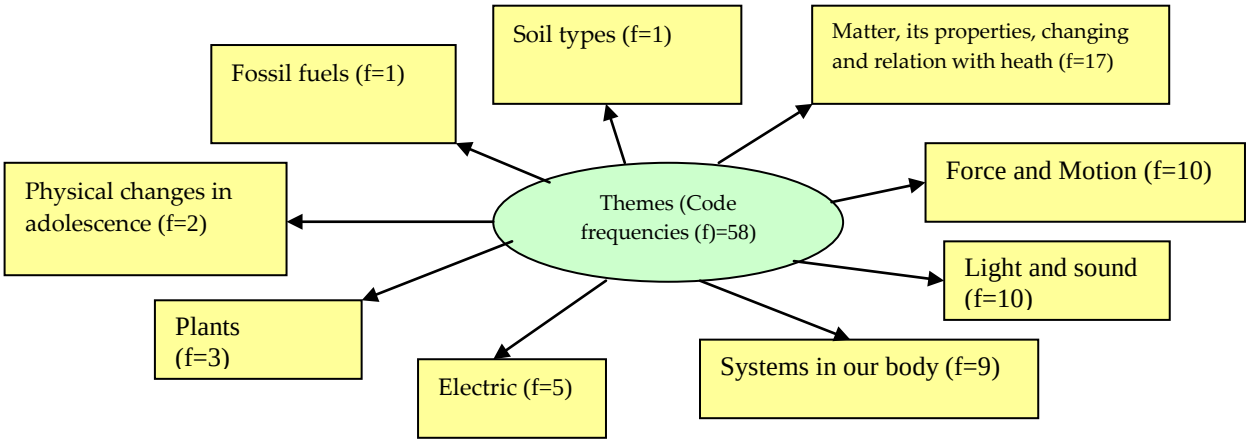
FINDINGS

Findings Obtained from Science Logs

For similar codes, 9 themes were defined by coding topics that students mentioned in their logs. These themes are general titles of topics that students related with science in their logs. In Figure 1,

there are determined themes and frequency of codes in these themes.

Figure 1: Themes determined according to codes that students related science and daily life in their logs



It was determined that students were mostly make relationships about topics as matter, its properties, changing and relation with heath (f=17). These examples can be given about this category from students' logs:

Student$_{10}$*:..I went kitchen for helping my mother and I would bring out ingredients for the salad. I asked my mother how many tomatoes would I bring out. My mother said it wasn't matter, I could put how many I wanted to. When mother said like that suddenly I remembered mixtures that I have learned in science and technology course. –Mixtures don't have a certain amount or rate.- So I put lots of tomatoes as I like. And its taste was very good…*

It was identified that students make relations in similar frequencies about topics as force and motion (f=10), light and sound (f=10) and systems in our body (f=9). Students' expressions about these categories from their logs can be exampled like:

Student$_{1}$*: "I saw two birds when I was going to market today. They found a rope and they were pulling the rope with their beak. But rope didn't move. Because, forces were balanced. But then position changed…*

Student$_{5}$*:…So we decided to go to picnic. Weather was good but suddenly it started to rain, but thunder was heard before. I looked at the sky, first light then sound came. Then I remembered that we had learned light is faster, sound is slower than light. Indeed I was faced an event relevant with we have learned. …*

Student$_{9}$*: "…Today in physical education course, our teacher told us wearing tight clothes would affect our circulatory system negatively. We have learned this also in science course. Suddenly I remembered*

circulatory system…"

Other topics that students especially mentioned in science logs are electric (f=5), plants (f=3), physical changes in adolescence (f=2), soil types (f=1) and fossil fuels (f=1).

Findings Obtained from Students' Views towards Science Logs

While 6 of the students mentioned that they had difficulties in relating events they encountered in daily life with science, 6 of them reported they didn't have any difficulties. 2 of the students who expressed that they had difficulties, explained finding hard to do it because they didn't interested in science and technology, 2 of them told that they had difficulties at first few days but then they could see the relation between daily events and science, and 2 of them reported they find it hard because they realized that they didn't really understand the topics. Students' own expressions are like these:

$Student_7$: "I find it hard when I started. When I wrote a few times, I got into it. When I encountered an event, it started to flash. "

$Student_2$: "It wasn't hard for me. I was keeping diary before. I had to add relationship between events and science topics in normal diary. Because telling are part of science topics and daily life. "

While 10 of the students expressed that they liked keeping science logs, 2 of them told they didn't like it. Students who liked keeping science logs, showed reasons as it developed their ability of relate events and science topics (f=4), they could easily write what they couldn't tell their teacher and friends (f=1) and they liked science and technology course (f=4). Students, who didn't like keeping science diary, has reasons as they find it difficult to write (f=1) and they didn't interested in science and technology course (f=1). Students' expressions are like these:

$Student_{12}$: "I like it. My way of relating events and science topics was changed. I start to think different about events. Even I tried to interpret the result of the event.

$Student_3$: "I didn't like it. Because, I can't write."

9 of the students expressed that keeping science logs contributed them to developing themselves about seeing relation between science and daily life, but 3 of them said it didn't provide any contribution. Students' expressions are like these:

$Student_{11}$: Yes, my view of daily events changed. While I have learned a topic, I had difficulty in relating it with events before. My way of relating events and science topics changed while writing science logs.

$Student_3$: "It didn't provide. But it showed me that I had learned the topics incomplete".

While 9 of the students reported that they would like to keep logs within science and technology course, 3 of them told they don't want to keep logs.

$Student_4$: "I would like to. My approach to daily events changed.

$Student_6$: "No. I don't want to."

While 11 of the students expressed that keeping science logs hasn't got a disadvantage, 1 of them emphasized that writing about topics which they didn't like was a disadvantage.

DISCUSSION

Students mostly related daily life and science about topics as matter, its properties, changing and relation with heath. And, force and motion, light and sound, systems in our body were other topics which were related in similar frequencies. Electric, plants, fossil fuels, physical changes in adolescence and soil types were topics that were related less than the others. In parallel to this finding, also Yılmaz (2008) identified that 6th grade primary school students could relate particulate nature of matter, which is a chemistry topic and friction force which is a physics topic of science and technology course, more than the other topics. But, unlike Yılmaz's (2008) study, it was seen that students could relate light and sound unit with daily life as force and motion in this study. Also, students' level of relating biology course topics with daily life was less than topics about physics and chemistry, according to this study's results. Even, İlkörücü Göçmen Çelebi (2007) determined that 6th grade students' level of relating biology topics with daily life was low.

Topics, which students related with science, are involved in units of 6th grade science and technology curriculum. Science diary application was done with students before the last unit. In this direction students could relate topics in other units except the last unit.

The majority of students emphasized that science logs were effective on developing their ability of relating science and technology course with daily life, they liked keeping science logs, they could keep logs within science and technology course and there wasn't any disadvantage of keeping science logs. However, half of the students reported, they had difficulties about relating daily life with science. Avcı Erduran (2008) and Uslu (2009) determined that most of the students liked writing logs, they understood themselves better, they could share their feelings and thoughts easily, it contributed them to review their lessons and their learning to be permanent in their study which they did within science and technology course.

Students' telling knowledge they learned on science and technology course with daily expressions, allowed identifying relations which they formed between science topics and daily life. Also, Avcı Erduran (2008) emphasized that science logs could be valid and reliable instruments for evaluating students and science logs allowed students to share their feelings and thoughts easily. In this

context, there are studies which were done for investigating learning of students in science and technology course, events they experienced during the day and their feelings from their logs. Also Rivard (1994) indicated that, students' understanding and learning science could be improved and developed by help of logs which writing process can be involved science education with.

CONCLUSION

In science logs which 6th grade primary school students write about relationship between science and technology and daily life, they mostly relate topics as matter, its properties and changing of matter. It was determined that students thought, science logs helped them to relate science and technology with daily life, also they liked keeping science logs. According to these findings obtained from the study, it can be said that science logs could be used as an evaluation instrument for investigating relationships which students formed between science and technology and daily life.

REFERENCES

Ajello, T. (2000). Science journals: writing, drawing and learning. *Teaching Pre K-8, February*.

Avcı Erduran, D., 2008. The use of student journals in science and technology education. *Eurasian Journal of Educational Research,* 30, 17-32.

Burns, M. and Silbey, R. (2001). Maths journals boost real learning: How words can help your students work with numbers. *Instructor, 110* (7), 18-20.

Duban, N. (2008). *Conducting science and technology course through inquiry-based learning approach in primary education: an action research*. Doctoral Thesis, Eskişehir Anadolu University.

Ekiz, D. (2006). Self-Observation and Peer-Observation: Reflective Diaries of Primary Student-Teachers. *İlköğretim Online, 5*(1),45-57.

Given L. M. (Ed.) (2008) *The Sage encyclopedia of qualitative research methods* (Vols. 1&2). U.S.A Sage publications.

Hanrahan, M. (1999). Rethinking science literacy: Enhancing communication and participation in school science through affirmation dialogue. *Journal Writing. Journal of Research in Science Teaching, 36*(6), 699-717.

Hargrove, T.Y. and Nesbit, C., 2003. Science notebooks: tools for ıncreasing achievement across the curriculum. *ERIC Clearinghouse For Science Mathematics And Environmental Education*. http://202.198.141.77/upload/soft/0-article/029/517024.pdf (19.12.2007)

İlkörücü Göçmençelebi (2007*). Primary school sixth grade students' levels of using biological knowledge and connecting with everyday life which is given at science courses*. (Unpublished doctoral dissertation). Uludağ University.

Meel, D.E. (1999). Email dialogue journals in a college calculus classroom: A look at the implementation and benefits. *Journal of Computers in Mathematics and Science Teaching, 18*(4), 387-413.

Miles, M.B. and Huberman, A.M. (1994). *Qualitative data analysis*. London: Sage Publiation.

Rivard, L.P. *(*1994*).* A review of writing to learn in science: Implications for practice and research. *Journal of Research in Science Teaching, 31*(*9*), 969-983.

Ruiz-Primo, M. A., Li, M., Ayala, C. C. and Shavelson, R. J. (2004). Evaluating students' science notebooks as an assessment tool. *International Journal of Science Education,26 (12),* 1477-1506.

Shepardon, D. P. ve Britsch, S. J. (1997). Children's science journals: Toll for teaching, learning, and assessing. *Science and Children, 34*(5), 13-17, 46-47.

Srimavin, W. ve Darasawang, P. (2004). *Developing self-assessment through journal writing.* Proceedings of the Independent Learning Conference 2003, Published 20 September 2004. Retrieved from http://independentlearning.org/ILA/ila03/ila03_srimavin_and_pornapit.pdf

Şahin, Ç. (2009). An examination of journals of prospective science teachers according to their reflective thinking skills**.** *Hacettepe University Journal of Education Faculty*, *36*, 225-236.

Uslu, h. (2009). Students' ideas about writing journals in science and technology and mathematics lessons in the sixth and seventh grades. Master Thesis, Süleyman Demirel Universitiy

Yıldırım, A. ve Şimşek, H. (2005). *Qualitative research methods in social sciences* (Fifth Edition). Ankara: Seçkin Press.

Yılmaz, N. (2008). Level of 6th, 7th, 8th year primary school and 1st class high school students and the candidates of science teachers for relating science with their daily life. Master Thesis, Gazi University.