



STUDENTS' ASSOCIATION LEVELS OF DAILY LIFE EVENTS ABOUT SOUND UNIT WITH SCIENCE AND TECHNOLOGY KNOWLEDGE

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Abstract

The main purpose of education is to provide students how to use acquired knowledge in their lives. For this reason the use of school science in students' everyday life should be discussed. Association levels of students' everyday life events about sound unit with science and technology knowledge is determined in this paper. 8th grade students (N=100) which are study in various schools in the province of Trabzon were asked to explain the 18 everyday life events with sound knowledge. Students' explanations were analyzed by using the codes true, partly true, false and empty. Then 6 students were interviewed about their levels of association in a semi-structured way. Most and least associations about sound knowledge with everyday life events were determined. It has been noticed that students' association levels of daily life events with sound knowledge are low. It has been found that students focus on the placement exams at the end of each academic year and they forget their knowledge about that academic year after the exam. In addition, some teachers use few daily life examples during the lessons and it is thought that this situation affects the levels of association. Teachers should enhance daily life examples about sound unit during lessons.

Keywords: Sound, Science and Technology, association, daily life

INTRODUCTION

The quality of any society is directly proportionate to education given to its members (Güneş & Demir, 2007; Sarier, 2010). As it is known education desires to change the behavior that aims to acquire individuals the ability of understanding everyday life events, solving their existing problems and living in accord with their environment (Yiğit, Devocioğlu & Ayvacı, 2002). Knowledge acquired in the process of education will be here to stay and easily applied to the new situations encountered if it is associated with everyday life (Coştu, Ünal & Ayas, 2007).

Reif and Larkin (1991) indicates that students have some problems meaning the difference between school science or scientist's science and everyday science. Because of these differences, they claim that students are unconsciously using alternative concepts and ways of thinking which are effective in everyday life, but not in science. Ogborn *et al.* (1996) indicate that examples from

the learners' surroundings need to take priority. In that case, by the help of science and technology, students will be far from memorizing, therefore the meaningful learning will be occurred (Anagün, Ağır & Kaynaş, 2010). It is thought that relating science concepts with everyday life facilitates learning that enhances interest and students' motivation (Cajas, 1999; Yiğit, Devecioğlu & Ayvaci, 2002; Coştu, Ünal & Ayas, 2007).

The quality of the given education is parallel with quality of syllabus. Syllabus is important at the realization of aims given in the description of education. To realize targeted learning by syllabus, it is essential for students to have the ability of associating everyday life events and face problems with the learnt knowledge. In this context, the importance of learning not only scientific knowledge, but also practicing this knowledge in daily life is emphasized at Science and Technology Syllabus prepared in 2004. In the new Science and Technology Syllabus, acquirements were designed in a way that students can learn the scientific meaning of the problems faced in daily life and they are expected to graduate as science literacy. For this reason, developing their problems solving ability during primary education will make contribution to individuals' success at life (Taşdemir & Demirbaş, 2010).

The association of school science with students' everyday life events is an educational goal which seems simple but this goal is complex, difficult and rarely studied (Cajas, 1999). According to the acquirements given in the new syllabus, students are expected to use their knowledge while explaining everyday life events about the units that take place in. Sound unit which is taught at 6th and 8th grade Science and Technology courses is one of them. In this research, it is aimed to determine the association levels of students' everyday life events about sound unit with science and technology knowledge.

METHOD

In this study, case study method is used for in-depth investigation of one or a few situations (Şimşek & Yıldırım, 2008). 18 everyday life events were ascertained and one of them was explained by the researchers as an example. 8th grade students (n=100) who study in various schools in the province of Trabzon were asked to explain the everyday life events with sound information. Then 6 students were interviewed about their levels of association in a semi-structured way. Students' explanations were analyzed by using the codes true, partly true, false, empty and their association levels were determined. While analyzing students' explanations, two physics teachers' opinions were taken.

- Explanations included all the scientific ideas, were accepted as **true**,
- Explanations included some scientific ideas but not totally true, were accepted as **partly true**,
- Explanations, which were irrelevant or not scientific, were accepted as **false**,
- Situations that had no explanations were accepted as **empty**.

FINDINGS

Students explained 17 everyday life events about sound unit by their science and technology knowledge. Their explanations were analyzed as true, partly true, false and empty. The frequencies of these categories are presented in Table 1. Percentages of explanations were not given in the table as the number of students already is 100.

Table 1. Everyday life events about 'Sound' and frequencies of students' explanations

Every Day Events	True	Partly True	False	Empty
Measurement of sea depth	12	25	33	30
Whales can hear each other even though they are 160 km away from each other	2	28	44	26
Locating Ore Deposits	6	15	38	41
Bats can't see at night but they can find their ways	14	20	43	23
Loudspeakers are in the form of cone	2	36	29	33
Usage of double glazing to block incoming sound from the outside	18	26	28	28
Studios' walls or ceilings being rough	15	20	28	37
Hearing sound more louder in empty houses	41	9	27	23
Putting your hands edge to your mouth while calling colleagues who are outlying from us	4	45	27	24
Piano's cover is arranged directly to the audience	4	11	49	36
Changing your voice by putting cloth in front of the talk handset while you are talking on the phone	31	10	32	27
The Indians put their ears on the train tracks to understand where it comes from	34	14	24	28
Forested areas are very quiet	31	0	33	36
Environment becomes quiet while it is snowing	32	5	35	27
Listening heartbeats with a stethoscope	11	10	33	46
We can't hear the sound of explosions in the sun	48	0	23	29
Skeleton structure and materials used in the production of instruments differs from each other.	17	27	18	37

It was seen that students' association levels of everyday life events with sound knowledge are low. On the other hand, it was determined that some students associate false, some of them made true associations and some of them could not associate their sound knowledge with everyday life events.

Most of the students made true associations about three everyday life events. Some of them are given as an example in the table below:

Table 2. True associations most of the students made.

Every Day Events	Explanations
Hearing sound more higher in empty house	<i>Sound is less absorbed because there is no barrier in front of it and sound becomes more loudness There is no substance that can absorb sound and it is reflected by the walls</i>
The Indians put their ears to the train tracks to understand where it comes from	<i>Sound diffuses through solids fast.</i>
We can't hear the sound of explosions in the sun	<i>Sound doesn't diffuse in space Sound is not heard because of the non-granular environment</i>

Most of the students made false associations about five everyday life events. Some explanations of students are given as an example in the table below:

Table 3. False associations most of the students made

Every Day Events	Explanations
Measurement of sea depth	<i>It can be explained by water pressure of sound Sound determines depth in liquids.</i>
Locating Ore Deposits	<i>Diffusion of sound in solids It may get out of vibration</i>
Piano cover is arranged directly to the audience	<i>It provides music to be more audible Piano is played more easily</i>
Whales can hear each other even though they are 160km away from each other	<i>Sound loudness The characteristic of sound diffusion</i>
Bats can't see at night but they can find their ways	<i>They have sharp eyes Diffusion of sound</i>

The interviewee gave some information about their Science and Technology courses. They explained their teachers' pattern of instruction during the courses, their level of association and also talked about the placement exams they enter at the end of each academic year by these statements:

"First of all teacher mentions concepts that should be known and then she/he asks the questions we may encounter at placement exam. He/she benefits from various sources and relates notes in textbooks."

"Our textbooks generally give examples about everyday life or it wants us to relate by ourselves"

"Firstly our teacher asks us five definitions about formulas and concepts she/he taught. Following questions are in the type of 'fill in the blanks and multiple choice tests'. By this way she/he provides us to comprehend the descriptions of terms."

"I cannot use acquired science knowledge in everyday life."

DISCUSSION

It is determined that students could not relate their sound knowledge with everyday life events. Anagün et. al (2010), proved that elementary students have some problems transferring their knowledge learnt in science and technology course into everyday life. Yiğit, Devocioğlu & Ayvaci (2002), also indicated in their research that a great majority of students cannot associate too. In related literature that thermometer and electric energy are the most; potential energy, heat energy and sound are the least related concepts in terms of association with everyday life events (Ayvaci & Devocioğlu, 2008).

In our interviews, students did not mention that their teachers use everyday life events during science courses. Few teachers were able to relate school science to students' everyday life events as Mayoh and Knutton (1997) emphasized in their research about school science and its relation with

students' out-of-school experience. The reason of this situation may be inadequate knowledge of teachers about relating everyday life with courses.

Erdem and Ersoy (2009) found that placement exam is an important barrier in front of the implementation of the new Science and Technology Syllabus. This exam may affect students negatively. They feel forced to focus on these exams. They cannot find enough time to study science and technology courses and to really understand it. They forget their knowledge about that academic year after the exam. When we look at the literature on the subject of lifelong learning, it is anticipated to train individuals who are having the ability of learning, problem-solving, decision-making, interoperable, creative and peaceful with himself/herself. However, these skills could be gained with students, drowned with continuous exams, with not exam-oriented, but with process-oriented system (Gündoğdu, Kızıldaş, Çimen, 2010).

The true associations were usually carried out with the sound unit knowledge at 8th grade level. Yılmaz (2008), researched the levels of 6th, 7th, 8th, 9th grade students' and candidate science teachers' association the basic science knowledge to daily life, found that 8th grade students were more successful than others in relating the basic science knowledge with daily life. Our study can be carried out with candidate science teachers to see the difference between them.

CONCLUSION

It has been noticed that association levels of students' everyday life events with their sound knowledge is low. Students focus on the placement exams at the end of each academic year and they forget their knowledge about that academic year after the exam. The associations about 8th grade level sound unit may be true due to this situation. In addition, it is identified through interviews, some teachers use few daily life examples during the courses. This situation may affect the level of association.

It becomes prominent that the content of placement exams done at the end of each academic year should be changed. Teachers should enhance daily life examples about sound unit during lessons. Helicoid structure of the syllabus should be kept in mind and teachers should remind 6th grade sound issues while leading in 8th grade sound unit.

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