English Language Course and Nature of Science in Secondary School for Grade 8th (Adana Sample from Turkey)

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Abstract

The major purpose of this research was to examine the learners' knowledge of nature of science in English learning process during the unit: Success Stories: A Living Scientist according to content and language integrated learning (CLIL). For this study, data were collected from 105 8th grade students attends a state secondary school in the province of Adana, Turkey during the 2014-2015 academic year. The data were gathered by the questionnaire that was prepared by the researchers, who collected the data in three weeks. The descriptive statistics were used. The frequencies, percentages, means and standard deviations were considered in the process of data analysis performed using Spss17.0 for windows. The data analysis showed the means of items. Item1 (Scientist studies only in the field of science), Item2 (Scientist studies only in the field of social & human science), Item6 (scientist is much concerned with his/her errors), Item13 (Scientist's life is filled with success), Item14 (Scientist was a successful student in his school life) and Item16 (Scientist's life is always full of happiness) were low, whereas the means of the other items on the questionnaire were high.

Keywords: Content and language integrated learning (CLIL), English language learning, nature of science, foreign language learning, language learning.

1. Introduction

CLIL stands for Content and Language Integrated Learning; it refers to teaching subjects (such as science, history and geography) to students through a foreign language. An English teacher uses cross-curricular content (or the subject teacher uses English as the language of instruction) in CLIL. Both methods result in the simultaneous learning of content and English. The term CLIL was used in 1994 by David Marsh, University of Jyväskylä, "CLIL refers to situations where subjects, or parts of subjects, are taught through a foreign language with dual-focused aims, namely the learning of content and the simultaneous learning of a foreign language". And, there was a heap of data pile which was derived from classroom interaction at the University of Jyväskylä, which contains video recordings of EFL and CLIL classrooms as well as subject lessons taught in Finnish. Indeed, foreign language teachers already have been using CLIL methodology for many years in foreign language teaching. For example, when we teach the vocabulary of the animals, fruits, countries, capital and cities, we use CLIL. We combine other fields of the course when we teach English as foreign language teachers.

In addition, "How much foreign language exposure do students get?" is very important in CLIL. The intensity of foreign language circulation may vary in the use of the target language. Learning is not a passive process where learner creates; thus a learner is active and he/she is major player in the learning process. CLIL is very compatible with this process and student can combine their nature of science knowledge (i.e. different fields of knowledge) in CLIL. Also, learner is effective and has a positive attitude on language learning process when CLIL is used. CLIL programs may be short-term or long-term, ranging from a sequence of lessons spanning a few weeks to entire school years and to entire school-careers. The main importance and significance of the study were to find out if CLIL helps language learners during language learning process.

This research aims to know whether the learners' knowledge of nature of science in English learning process during the unit: Success Stories: A Living Scientist according to CLIL or not. The major purpose of this research was to examine the learners' knowledge of nature of science in English learning process during the unit: Success Stories: A Living Scientist according to content and language integrated learning (CLIL). The following question has been sought to answer in this frame:

1) Are there any differences in the learners' use of knowledge of nature of science in English learning process during unit 9: Success Stories: A Living Scientist according to content and language integrated learning (CLIL).

2. Theoretical Approaches to CLIL and Second & Foreign Language Learning

Snow (1998) pointed out the conceptual background of CLIL and CBI (Content Based Instruction). CLIL was grouped into input-output theories and participation-based theories in language learning environment. Krashen (1981, 1982, and 1985) stated the most widely known reception-based theory of language acquisition is Krashen's Monitor Model in which the concept of Comprehensible Input plays a key role. The basic idea of the model is that if the language learner is exposed to input, which is comprehensible either because of the context, in which it occurs or through intentional simplification (child-directed speech, foreigner talk), acquisition will occur, especially if the learning situation is characterized by positive emotions (Affective Filter). Krashen stresses that optimal comprehensible input is not grammatically sequenced but first and foremost focused on meaning (Dalton-Puffer, 2007). Krashen's theory is firmly linked with approaches of Chomsky to second or foreign language acquisition with emphasis on seeing the language learner essentially as self-contained language processor and grammar builder. According to Krashen & Terrel (1983) in this sense, the idea of CLIL with its emphasis on the meanings provided by the content subject seemed to finally answer the description of a truly *Natural Approach* where language acquisition could run its course 'naturally' under meaningful and affectively positive conditions (Dalton-Puffer, 2007).

3. Nature of Science

Nature of Science vision is based that "All citizens should be science literate" in the formal curriculum on science course (lessons). This vision was started in 2004; students use scientific knowledge for their personal and social decisions (Köseoğlu, Tümay & Budak, 2008).Therefore, an insight about the nature of science is the critical and basic element of understanding -STS (Science-Technology-Society) that is one of the dimensions (Lederman, 2004). The nature of science brings various science areas such as history, sociology, psychology and philosophy and, it consists of answers to questions such as " What is science?", "How does it work?", " How does scientists study?", "What is the impact of social and cultural ties on science?" (Mc Comas & Olson, 2000). Giddings (1982), Lederman (1983), Cleminson (1990), Ryon & Aikenhead (1992) had access to some common basic views about the nature of science. These are classified in 5 main categories: scientific knowledge, scientific methods, scientific theories and laws and scientists role (Türkmen & Yalçın, 2001). Science and scientist are important role in Nature of Science vision. The pages are related to "unit 9: Success Stories: A Living Scientist" can be seen in English Course Book Unique 8, Spot on Grade 8: Student's Book and My English 8: Student's Book. As seen, it can be explained by some common basic views about the nature of science such as scientific knowledge, scientific methods, scientific theories and laws and scientists role through foreign language teaching. When related course books (English Course Book Unique 8, Spot on Grade 8: Student's Book and My English 8: Student's Book) were examined, units and topics related to Nature of Science are found in science and technology curriculum for 6th grade, hence 8^{th}grade students can combine previous knowledge during English learning through cognitive process.

4. Methods

The data were collected from the questionnaire prepared by the researchers. Descriptive statistics were used; the means and standard deviations were considered in the process of data analysis using the windows version of Spss17.0.

4.1. Study Group

The participants were 105 students in Adana (Turkey) State Secondary school in 2014-2015 academic sessions. There were 51 female and 54 male participants in the study; 74 of the students were 14 years old, 23 were 15 years old, 7 were 13 years old, and the remaining 1 student was 16 years old.

4.2. Data Collection Tool

The questionnaire was developed and applied in Turkish. The data, which pertained to the development of the questionnaire through a factor analysis, were shaped via the following statistical methodologies: the Kaiser-Meyer-Olkin (KMO) measure; the Bartlett test, was used to assess the validity of the questionnaire, and Cronbach's alpha was used to measure the reliability and internal consistency of the questionnaire. Factor analysis was administered to test the validity about construct relation of the questionnaire. The test revealed that the items in the questionnaire were valid. The factor load values of all items are between 0.80 and 0.45. According to Tabachnick and Fidel (2001), the items' value of a variable load should be above 0.32. Comrey and Lee (1992) suggested the value of a variable load (Büyüköztürk et al., 2010): a) 0.71 (which describes 50%) "Perfect", b) 0.63 (which describes 40%) "Very good", c) 0.55 (which describes 30%) "Good" and d) 0.45 (which describes 20%) "Average", e) 0.32 (which describes 10%) "Weak". Items 1, 2, 3, 5, 17, 18, 19, 20, 21, 22 and 23 were developed according to some common basic nature of science views of Giddings (1982), Lederman (1983), Cleminson (1990), Ryon & Aikenhead (1992) as Türkmen & Yalçın (2001) cited. Other items were developed (prepared) according to the basic contents on English Textbooks, Unit 9: Success Stories-Living scientist. Cronbach's alpha value was 0.78 for the reliability of the questionnaire's internal consistency. Kaiser-Meyer-Olkin (KMO) measure yielded a value of 0.802. Bartlett test was 946,487. A factor analysis was conducted to test the validity of the construct relations within the questionnaire and revealed that the items in the questionnaire were valid. The factor load values of all items are between 0.77 and 0.48. Twenty-three items were applied to the study group using a likert type scale. Students stated their views: "I completely agree", "I agree", "I am undecided", "I disagree", and "I strongly disagree".

4.3. Data Analysis

Descriptive statistics were used. The means and standard deviations were considered in the process of data analysis performed using Spss17.0 for windows. The descriptive statistic was presented as shown in Table. 1.

Table1. Descriptive Statistics of the items

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Item 1	105	1,00	5,00	2,8762	1,60345
Item 2	105	1,00	5,00	2,7238	1,45110
Item 3	105	1,00	5,00	3,9048	1,25976
Item 4	105	1,00	5,00	4,2476	1,02639
Item 5	105	1,00	5,00	3,9238	1,01617
Item 6	105	1,00	5,00	3,1619	1,33102
Item 7	105	1,00	5,00	4,3429	,94897
Item 8	105	1,00	5,00	4,1524	1,18306
Item 9	105	1,00	5,00	3,3714	1,11163
Item 10	105	1,00	5,00	4,2857	1,05351
Item 11	105	1,00	5,00	4,1429	,97496
Item 12	105	1,00	5,00	4,1238	1,02559
Item 13	105	1,00	5,00	3,0571	1,15882
Item 14	105	1,00	5,00	3,0381	1,19231
Item 15	105	1,00	5,00	3,8571	1,03244
Item 16	105	1,00	5,00	2,8381	1,05724
Item 17	105	1,00	5,00	3,9429	,98867
Item 18	105	1,00	5,00	3,7143	1,02577
Item 19	105	1,00	5,00	3,8381	1,11910
Item 20	105	1,00	5,00	3,5905	1,12400
Item 21	105	1,00	5,00	3,4476	1,16008
Item 22	105	1,00	5,00	3,8286	1,20462
Item 23	105	1,00	5,00	3,8857	1,21935
Valid N (listwise)	105				

4.4. Findings

The data analysis showed the means of items. According to these results, Item 1 (Scientist studies only in the field of science), Item 2 (Scientist studies only in the field of social-human science), Item 6 (scientist is much concerned with his/her errors), Item 13 (Scientist's life is filled with success), Item 14 (Scientist was a successful student in his school life) and Item 16 (Scientist's life is always full of happiness) means were low, whereas the means of the other items on the questionnaire were high; these items are: Item 3 (Scientist can study in different fields like science and social-human), Item 4 (Scientist constantly tries to learn more), Item 5 (Studies in scientific fields serve humanity), Item 6 (Scientist is concerned too much with his/her error(s)).

Item 7 (Scientist is determined in his/her study), Item 8 (Scientist does not give up trying), Item 9 (Scientist sleep less), Item 10 (Scientist works hard), Item 11 (Scientist never loses hope on he/she will be successful), Item 12 (Scientist may encounter with challenges (difficulties, errors, misfortune, etc.) in his/her study), Item 15 (Scientist insist on his/her study), Item 17 (Science is ongoing knowledge activity), Item 18 (Detailed studies and hypotheses were conducted by scientists, leads to further invention), Item 19 (Science opens to all kinds of research without being restricted with religious, geographic and political factors), Item 20 (New evidence allow to change the scientific ideas), Item 21 (Science is an activity done by human with all form), Item 22 (The social aim of scientific enterprise is to produce new knowledge for science) and Item 23 (All humanity has contributed science).

5. Conclusion

The nature of science vision can be used and applied in CLIL lessons. Science and scientist are important role in nature of science vision. When "Unit 9: Success Stories: A Living Scientist" is examined in English Course Book Unique 8, Spot on Grade 8: Student's Book and My English 8: Student's Book for 8th grade students, concepts of these unit can be explained through some common basic views about the nature of science such as scientific knowledge, scientific methods, scientific theories and laws and scientists role through foreign language teaching process. Units and topics related to nature of science are found in science and technology curriculum for 6th grade, thus 8th grade students can combine previous knowledge when learning English language in cognitive process. Dalton-Puffer (2007) states that CLIL lessons are familiar environments for second language use that is outside the foreign language classroom. CLIL students' familiarize with the ground rules of classrooms in their education system and L1 (main language)-matrix culture reduce this cognitive load in significant ways and allows them to concentrate on language production. The increased L2 (foreign language) confidence of CLIL learners unanimously reported by practitioners may well be derived from this source as well as from the fact that teachers do not fuss about grammar mistakes.

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