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Investigation of primary school teachers' opinion about revised 3rd grade science curriculum in Turkey

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One of the aims of science curriculum is to understand technology that is used in all areas of daily life. Thus, science curriculum should be revised in a feasible and dynamic manner for the quality. The purpose of the study is to investigate primary school teachers' opinions about renewed 3rd grade science curriculum. The sample of the study consisted of 160 4th grade primary school teachers working in public primary schools during 2014 and 2015 academic years. This is a descriptive research design. The data obtained from the surveys were analyzed by using frequencies, percentage, mean and standard deviation. T-test and One-way Anova were used for parametric variables. Findings of the study showed that teachers maintained that the content of the revised 3rd grade science curriculum was adequate and taking science course to the 3rd grade course was the correct decision.

Key words: Science curriculum, 3rd grade science lesson, teachers' opinions.

INTRODUCTION

Education has been defined as the process of changing behaviors. Education is a lifelong process if we consider that the likelihood of behavior patterns can be changed any time. It is expected that there will be a change in the behavior of the individuals after certain education process. Aims, knowledge, behaviors, attitudes and values of individuals can be changed through education (Kaya, 2005). Individuals have to keep up with change, open to technological innovations and be productive in today's world as science and technology make tremendous changes and progress (Etkina et al., 2008). Thus, individuals must take responsibilities to increase the quality of the life, to increase societies consciousness, and to develop their countries. According to Soylu (2004) this is only achieved by nurturing individuals as productive, innovative, inquisitive and critical citizen through qualified education. Modern education approaches emphasize student-centered learning, cognition, problem solving, and critical thinking. Science courses provide the most sufficient opportunity to students to gain these concepts (Corcoran et all, 2009).

Scientific and technologic development, new application in teaching methods, and the need of continuity of curriculum development activities required revision of the science curriculum (Akdeniz et al., 2004). Thus, National Ministry of Education (2000) mentioned that the science curriculum must be revised by considering these requirements.

The requirements for the revision and development of

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the science curriculum have become necessary in the 2000s. For this purpose, positive and negative aspects of the science curriculum have been evaluated, and the new science curriculum was structured taking these qualifications into consideration. The concept of “technology” has been added to the curriculum, and the name of the course renewed as “Science and Technology” in 2005. Besides, the science course hours have been increased to four hours per week, which were three hours per week in previous curriculum (National Ministry of Education (NME), 2005). The science curriculum was required to be redeveloped as a result of system change in education called 4+4+4 system and current innovations and scientific developments. Thus, some regulations have been made and the name of the course has been changed as “Science”.

When the curricula are considered in terms of "science literacy", the aim of "all students are educated as science and technology literate" in the 2005 Science and Technology course curriculum is also maintained in the renewed 2013 Science curriculum. Because of the change in the name of the course, the "science and technology literacy" statement was included in the 2005 curriculum while the "science literacy" statement was used in the 2013 Science curriculum. The scientific process skills have continued to be a dimension of science literacy in both previous and current science curricula (National Ministry of Education, 2005; National Ministry of Education, 2013). While the Science and Technology curriculum consisted of seven learning areas to provide science and technology literacy, the 2013 Science curriculum includes four learning areas. This decline is structured not so much as to create a deficiency in the program, but rather to complement each other.

The 2013 Science curriculum adopts a research inquiry-based learning strategy that allows students to assume responsibility of their own learning, to actively involve learning and teaching process, and to reestablish knowledge in the minds; while 2005 Science and Technology curriculum is based on constructivist learning strategy. The purpose of constructivist science teaching is to adopt students’ previous knowledge to new scientific knowledge. Thus, teachers must first try to identify what students know about the new topic already and how they relate their past experience with new topic (Bağcı-Kılıç, 2001). Orhan (2004) stated in his article about science teachers’ problem solving skills that constructivist science education is more successful than traditional science teaching.

It was expressed in the 2013 Science curriculum that informal learning should be carried out not only in the school environment but also in students’ daily life. Similarly, several studies have mentioned that activities occur out of classroom may provide students with high level thinking skills and increase student awareness through looking at different point of view (Coşkun-Keskin and Kaplan, 2012). In addition, there was a significant decrease in the total number of acquisitions in the 2013 Science curriculum while there were no changes in the hours of the course. Indeed, there were 807 acquisitions in 2005 Science and Technology course while this number decreased to 266 in the 2013 Science curriculum. Another change in the 2013 science curriculum is the increase in the number of achievements as the class level progresses. This significant difference will make it easier for teachers, who are practitioners of the curriculum, to reach aim of the acquisitions, and provide more permanent learning for students. Thus, it facilitates the transformation of the acquisitions into behaviors.

It can be concluded that the 2005 Science and Technology curriculum is revised in 2013. Also it can be stated that changes in the location of subject areas can be thought of as facilitating the implementation of contextual end-of-topic integrity and application. The Science and Technology course was started in the 4th grade in the 2005 curriculum; however, it starts in the 3rd grade in the 2013 Science curriculum. The purpose of the research is to investigate primary school teachers’ opinion about 3rd grade Science curriculum, which was revised in 2013 and gradually started to be applied.

METHODOLOGY

Design of the study

A descriptive model was used in this research, which aimed to investigate elementary school teachers’ opinion about 3rd grade Science curriculum. The author applied descriptive model to reveal the existing situation as it is. In this research, both qualitative and quantitative methods were used in the process of collection, analysis and interpretation of the data. Qualitative research is a process that enables qualitative data gathering methods such an observation, interview and document analysis to be used in a realistic and holistic way in the context of the existence of facts and events (Yıldırım and Şimşek, 2006: 147).

Study group

The population of the research is 4th grade teachers, who have been teaching the revised 3rd grade Science curriculum in the public schools affiliated to the National Ministry of Education in the city of Şanlıurfa in 2014-2015 academic year. The sample of the study consisted of 160 4th grade teachers, who are currently working in public primary schools. All of these teachers were selected from teachers who had taught 3rd grade in the previous academic year. Convenience sampling was used to the process of sample selection. Convenience sampling allows the researcher to sample from around the study (Balcı, 2005: 122). The researcher selected a condition that is close and easy to access in convenience sampling method. This sampling method gives speed and practicality to research (Yıldırım and Şimşek, 2006: 156).

Data collection instruments

Two different data collection tools were used in this study, which

Table 1. Comparison of 4th grade teachers' scores about 3rd grade science curriculum based on gender.

Variable	X	SD	t	df	P
Male	107.427	20.565	1.672	158	0.097
Female	112.109	14.854			

N=160; p>0.05.

Table 2. Comparison of 4th grade teachers' opinion about 3rd grade science curriculum based on their place of duty.

New Curriculum	df	Sum of squares	F	P
Place of duty				
Between Groups	2	221.892	0.726	0.486
Within Groups	157	305.770		
Total	159			

p>0.05.

aimed to examine the appropriateness of the renewed Science curriculum. First, personal and open-ended questions were used in the first part of the survey. In the second part, a survey called "Teachers' Opinion about Renewed Science Curriculum Survey" was used to determine the appropriateness of the renewed curriculum. The second part of the survey consisted of 27 items, which has the ability to examine the 3rd grade science curriculum.

The reliability and validity analysis of the survey was conducted by Temli Durmuş and Ok (2014:70) and found that the Cronbach alpha internal consistency was 0.949.

Data collection

Within the scope of the research, the researcher gave verbal directions and the teachers marked the items. After the survey and interview forms were applied, the data were collected and interpreted statistically. Convenience sampling method was applied to the available 4th grade teachers, who have been teaching the revised 3rd grade Science curriculum by asking questionnaire questions.

Analysis of the data

The data of the study were analyzed after the first data collection tool was applied. The author used content analysis method for the purpose of the research. The main purpose of the content analysis is to reach concepts and relationship which can explain the collected data (Yıldırım and Şimşek, 2006: 146). The data were coded by the researcher. Then, the author created themes by using the codes. During the coding process, personal information of the participants was kept confidential and coded in the format of T1, T2, T3…In the next process; the data were transferred to the digital environment to make statistical analysis. The author coded 5 for "Strongly Agree", 4 for "Agree", 3 for "Neither Agree Nor Disagree", 2 for "Disagree", and 1 for "Strongly Disagree". The obtained data are graded from 1 to 5 on the scale used, divided into 5 peaks so that each interval will be 1 point, and the scale is used by using the graded scale based on the range of points corresponding to each option. Percentage, frequency, arithmetic mean and standard deviation of each item were calculated.

FINDINGS

Table 1 shows participants' scores from the scale. The author used independent sample t-test because the data is normally distributed. Independent t-test results were given in Table 1 based on the gender variable.

Table 1 shows that male teachers' scale score was 107,427 and standard deviation was 20,565; while female teachers' score was 112,109 and standard deviation was 14,854. According to the independent sample t-test result, there was no significant difference between male and female teachers' scores ($t_{(158)}$=1.672, p>0.05).

Table 2 shows the 4th grade teachers' opinion about 3rd grade science curriculum based on their place of duty.

A one-way analysis of variance (ANOVA) was conducted to examine 4th grade teachers' opinion about 3rd grade science curriculum based on their place of duty. The result shows that there was no significant difference between groups ($F_{(2, 157)}$= 0,726 p>0.05). In other words, there was no statistical significant difference between teachers' opinions who worked in downtown, county or village.

Table 3 presents the 4th grade teachers' opinions about the sufficiency of the contents of the 3rd grade science curriculum.

According to the findings in Table 3, 62.5% of teachers stated that the content of the science curriculum in 3rd grade is sufficient while 37.5% stated that the content is insufficient. One participant (T124 coded teacher) expressed his opinion as follows "The content of the science curriculum is sufficient for the class level. Also,

Table 3. Opinions about the contents.

Code	F	%
Content is sufficient	100	62.5
Content is insufficient	60	37.5
Total	**160**	**100.0**

Table 4. Creating basis for 4th grade.

Code	F	%
Creates Basis	98	62.00
Not Create Basis	60	28.00
Total	**158**	**100.0**

Table 5. Opinions about the relationship between renewed science curriculum and daily life.

Code	F	%
Sufficient relationship with daily life	102	65.80
Insufficient relationship with daily life	43	27.74
Increase awareness.	10	6.46
Total	**155**	**100.0**

acquisitions are suitable for students' level". On the other hand, another participant (T62 coded teacher) asserted her ideas as follows "It is insufficient. More space should be given to some topics such as Journey to the World of Living and Balanced Nutrition".

Table 4 shows the analysis of answers given by the participants to the question of "Can the 3rd grade science curriculum in practice create the basis for the 4th grade subjects?"

According to the findings in Table 4, most of the teachers (62%) concluded that 3rd grade science curriculum creates basis for 4th grade science curriculum; however, 28% of teachers believed that it does not create basis for the 4th grade curriculum. T124 coded teacher stated her opinion as follows "I think it will. The topics of this year are preparing for the 4th grade and increasing background information". On the contrary T58 coded teacher stated her ideas as follows "I think it would not create basis for 4th grade because 4th grade science curriculum includes more concepts and it can be difficult to understand".

Table 5 presents the analysis of teachers' opinions about the relationship between renewed science curriculum and daily life.

Table 5 shows that most of the teachers (65.80%) accepted that science curriculum sufficiently related to the daily life; nonetheless, 27.74% of teachers stated that science curriculum is insufficiently related to daily life. One participant (T92 coded teacher) expressed her ideas as follow "In daily life, they learn the sources of sound and light in the environment, the tools and materials related to them, and the functions of these tools, so they are related to daily life". Similarly, T9 coded teacher stated that "Students will be more conscious because the topics related to their daily life." On the other hand, T32 maintained that "Some science topics are not related to daily life or its relationship is insufficient".

Table 6 presents analysis of teachers' opinion about whether the duration of the third grade science course is sufficient in terms of learning the topics permanently.

According to Table 6, majority of the teachers (82.78%) thought that the duration of the third grade science course is sufficient to learn the subjects more permanently. On the contrary, 17.82% of teachers stated that it is insufficient. T113 coded teacher maintained that "Time is enough. As the topics are simple, repetitions, applications, evaluations are made permanent. We do not know how to fill the course because duration of the course is too long". On the other hand, another teacher (T15) stated that "Duration of science course is insufficient based on Constructivist approach. Students should learn this course by doing. Time runs out when

Table 6. Data related to duration of science course.

Code	F	%
Sufficient	125	82.78
Insufficient	26	17.22
Total	**151**	**100.0**

Table 7. Teachers' opinions about starting science curriculum at 3rd grade.

Theme	Code	F	%
	It is right	76	34.54
	It creates basis for 4th grade	37	16.81
	Science topics are lessened	24	10.90
Positive	It creates curiosity	19	8.63
	It increases awareness	9	4.09
	It increases awareness to the environment	7	3.18
	It provides learning through experience	6	2.72
	There is no difference	27	12.27
Negative	It should start at 4th grade	15	6.81
	Total	220	100.0

Table 8. Deficiencies in the science curriculum.

Code	F	%
Science curriculum is suitable for student level	45	21.32
The times for the units are too long	41	19.49
Topics are not enough for 3rd grade	29	13.74
Topics should be related to Daily life.	27	12.79
It is not appropriate for student level	21	9.95
Inadequate observation and experiment	19	9.00
Lack of related samples	9	4.26
Inadequate curriculum	7	3.31
Information are not understood	6	2.84
There are too much details	4	1.89
Lack of evaluation part	3	1.42
Total	211	100.0

using student-centered approach".

Table 7 shows the frequency and percentage of teachers' answers for the question "What is your opinion about starting Science curriculum at 3rd grade?"

According to Table 7, majority of the teachers provide positive opinions about starting science curriculum at 3rd grade. It was concluded from the table that 34.54% of the teachers believed that this implementation is right, 16.81% stated that it creates basis for 4th grade, 10.90% mentioned that science topics are lessened, 8.63% indicated that it creates curiosity, and 4.09% agreed that it increases awareness. However, 12.27% of the teachers stated that there is no difference in the curriculum. One participant (T71) shared his ideas as follows "I think it is beneficial. It increases students' interest to the lesson and stimulates curiosity and leads them to investigate and think". Similarly, T35 postulated that "It increases student participation through observation". T17 stated that "3rd grade science curriculum includes several topics which take students attention". On the contrary, T23 indicated that "I think there are no major changes in the curriculum. These topics were in the Life Science before and now it is in Science curriculum".

Table 8 shows teachers' responses about the question

"What are the deficiencies seen in the renewed science curriculum?".

According to Table 8, 21.32% of the teachers stated that science curriculum is suitable for student level. On the other hand, 19.49% of the teachers said that "the times for the units are too long", 13.74% of the teachers stated that "Topics are not enough for 3rd grade", 12.79% of the teachers stated that "science topics are not related to daily life", 9.95% of the teachers mentioned that "science curriculum is not appropriate for student level", and 9% of the teachers stated that "science curriculum has inadequate observations and experiments". According to T37 coded teacher, "Science curriculum is appropriate for the student level, but the biggest problem is insufficient equipment. Thus, we cannot make activities". Another teacher, T21, shared her opinions as follows "Lesson times are too long, we do not know how to fill it". T98 coded teacher stated that "The biggest problem is crowded class, and we are not able to fully control and secure our experiment". These findings showed that deficiencies are not only due to science curriculum but also the physical conditions of the school.

DISCUSSION

The purpose of the study is to investigate primary school teachers' opinion about 3rd grade Science curriculum, which was revised in 2013. Thus, the researcher examined teachers' opinions about deficiencies in the science curriculum, what effect does the program have on students, duration of the curriculum and the sufficiency of its content, whether gender and place of duty affect their opinion.

The findings revealed that there was no significant difference in the evaluation of the new Science Curriculum based on the gender of primary school teachers. It can be concluded from this finding that being male of female does not affect teachers' opinion about new science curriculum ($p>0.05$). Similarly, the results showed that there was no significant difference in the teachers' opinions about revised science curriculum based on place of duty.

4th grade teachers expressed that the content of the revised 3rd grade science curriculum is sufficient; while some of them asserted that duration of the course is too long. On the other hand, other teachers stated that duration of the course is fine when students are learning through by doing based on constructivist approach. Erdoğan (2005: 405) stated in his research that teachers' activities in the classroom in previous years have started to be practiced in laboratory with the new science program. Also, teachers emphasized the increased communication between group work and teacher-student and student-student in the classroom (Duschl, 2007). Revised science curriculum supported students' active participation during the learning process. In addition, revised science curriculum is student-centered and emphasizes the importance of learning through experience.

The majority of the teachers stated that 3rd grade science curriculum can create a basis for 4th grade science topics. Similarly, Ünişen and Kaya (2015: 569) concluded that most of the teachers expressed positive views on the starting science curriculum in the 3rd grade. In our research, the positive attitudes of the teachers towards the 3rd grade science curriculum are compatible with the previous researches.

The majority of the teachers believed that revised science curriculum related to daily life, and students will be able to create solutions to the problems they faced. On the other hand, some teachers believed that there are some topics which are not related to students' daily life (Stephen, 2014). In 2013 science curriculum, the subjects were simplified and the numbers of acquisitions were reduced. Because the number of lessons for per acquisition increased; it has led to positive opinions among teachers. It can be concluded that, starting science curriculum in the 3rd grade and giving daily life related examples has positive impacts on students (Eskicumalı et al., 2014: 1088). According to Gürdal (1992: 186), kids are most curious between 6-14 years old and they are more curious about science topics. Therefore, concrete examples related to daily life should be given to students, science literacy and the relationship between science-technology-society-environment should be given, a system of thought that can connect science issues should be established during this period.

4th grade teachers stated that renewed 3rd grade science curriculum is appropriate to the students' level. In this research, most of the participant agreed that science curriculum is student-centered and appropriate to 3rd grade students' level; and it considers students' development. In addition, renewed science curriculum allows students to discover the information and encourages group work (Tüysüz and Aydın, 2009: 45). Similarly, Anagün et al. (2015: 132) concluded that pre-service primary school teachers thought that the content of the renewed science curriculum was suitable for students.

Primary school teachers complained of insufficient equipment, observation and experiment. Several studies stated that teachers have faced some problems due to lack of equipment (Kazu and Aslan, 2012: 700; Karakuş et al., 2014: 225). This problem is one of the most common problems in the implementation of the curriculum. Lack of the time for implementing activities and lack of materials for conducting experiments are reported as the most common deficiencies in the new science curriculum. Teachers who are working in low-profile schools asserted that they could not implement the renewed science curriculum. In his research about science attitude and behavior, Öz (2007: 145) stated that the problems that he faced are inadequate materials and lack of sufficient information about renewed curriculum. The results of Karatay et al. (2013: 242) research about

comparison of 2005 and 2013 science curriculum, Toraman and Alcı (2013: 19) study about science teachers' opinions about renewed science curriculum, and Özata and Özkan's (2014: 239) research about comparison of 2005 and 2013 science curriculum support the result of this study.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Akdeniz AR, Yiğit N, Kurt Ş (2004). New Science Curriculum and Related Teacher Thoughts. V. National Science and Mathematics Education Congress Proceedings 1 (16-18 September 2002). Ankara State Books Directorate Printing House, pp.400-406.

Anagün ŞS, Kılıç Z, Atalay N, Yaşar S (2015). Are Primary School Candidates Teachers Ready to Apply the Science Curriculum? Turkish Studies -International Periodical for the Languages, Literature and History of Turkish or Turkic 10(11):127-148

Bağcı KG (2001). Constructivist Science Teaching. Educational Sciences: Theory and Practice 1:9-22.

Balcı A (2005). Research Methods, Techniques and Principles in Social Sciences (3rd edition). Ankara PegemA Publishing.

Corcoran T, Mosher FA, Rogat A (2009). Learning Progressions in Science: An Evidence-based approach to Reform (CPRE #RR-63). Consortium for Policy Research in Education, Center on Continous Instruction Improvement, Teachers's College, New York: Columbia University. http://www.cpre.org/.

Coşkun KS, Kaplan E (2012). Toy Museums as pre-School Learning Environment in Social Studies and History Education. Electronic Journal of Social Sciences 11(41):95-155

Durmuş TY, Ok A (2014). Development of Teachers' Views Scale on Science and Technology Curriculum: A Validity and Reliability Study. Elementary Education Online 13(1):62-73.

Duschl RA, Schweingruber HA, Shouse AW (2007). Taking science to school: Learning and teaching science in grades K-8. Washington DC: National Academies Press.

Erdoğan M (2005). Renewed fifth grade science and technology curriculum: Feedbacks of pilot practice. Feedbacks in Education: Paper presented at VIII Symposium on Evaluation of New Primary Education Programs. Ankara Sim PrintShop

Eskicumalı A, Demirtaş Z, Gür ED, Arslan S (2014). The Comparison of Science and Technology Curriculum and Renewed Science Curriculum. International Journal of Human Sciences 11(1):1077-1094.

Etkina E, Karelina A, Ruibal VM (2008). How long does it take? A study of student acquisition of scientific abilities. Physical Review Special Topics - Physics Education Research 4(2):1-15.

Gürdal A (1992). The Importance of Science in Primary Schools. Hacettepe University Journal of Education 8:185-188.

Karakuş M, Aslan S, Ergüven S (2014). Analyzing The Views Of Primary Teachers Related to 4th Grade Social Studies Curriculum. Turkish Studies 9(8):209-234.

Karatay R, Timur S, Timur B (2013). Comparison of 2005 and 2013 Science Course Curricula. Adıyaman University Journal of Social Sciences Institute 6(15):233-264.

Kaya Z (2005). Instructional Technologies and Material Development. Ankara Pegem A Publishing.

Kazu H, Aslan S (2012). Investıgatıon of Views of Multıgrade Classroom Teachers on Life Sciences Curriculum (A Qualitative Study). Turkish Studies 7(2):693-706.

National Ministry of Education (NME) (2000). Primary Education Institutions' Science Teaching Program. Journal of Turkish Education Board.

National Ministry of Education (NME) (2005). The Teaching Program of Primary Science and Technology Course (6, 7 and 8th grade). Ministry of National Education.

National Ministry of Education (NME) (2013). The Teaching Program of Primary Education Institutions (Elementary and Secondary schools) Science Courses (3, 4, 5, 6, 7 and 8th grades). Ministry of National Education.

Orhan AT (2004). Comparing the Effect of Science Teaching about Photosynthesıs Subject based on Constructivist Approach and Based on Traditional Approach on achievements of science teacher candidates (3. Grade). Unpublished Master's Thesis. Gazi University Institute of Educational Sciences Ankara.

Öz B (2007). Teachers' Opinions about Primary Science Course in 2001 and Primary Science and Technology Course Programs in 2005. Unpublished Master's Thesis. Cukurova University, Institute of Social Sciences Adana.

Özata YE, Özkan M (2014). Comparison of 2013 Science Education Curriculum with the 2005 Science and Technology Curriculum in Terms of Environmental Topics. Uludağ University Journal of Education 26(1):237-265.

Soylu H (2004). New Approaches in Science Teaching, Discovery Learning. (1.Edit). Ankara Nobel Publishing.

Stephen LP (2014). The Next Generation Science Standards: The Features and Challenges. Journal of Science Teacher Education 25:145-156.

Toraman S, Alcı B (2013). Views of Science and Technology Teachers about the Renewed Science Curriculum. Journal of EKEV Academy 17(56):11-22.

Tüysüz C, Aydın H. (2009). Primary School Science and Technology Teachers' Views on the Renewed Science and Technology Program. Journal of Gazi Education Faculty 29(1):37-51.

Ünişen A, Kaya E (2015). An Investıgatıon into Teachers' Views on Placement of Science Education in Primary 3rd Grade. Adıyaman University Journal of Social Sciences Institute 8(20):546-571.

Yıldırım A, Şimşek H (2006). Qualitative Research Methods in Social Sciences. Ankara Seçkin Publications.