OVERVIEW ON TEACHERS' VIEWS OF SCIENCE AND TECHNOLOGY CURRICULUM

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Abstract
The objective of the present study is to reveal whether there were any significant differences in teachers' general views of Science and Technology Curriculum teaching at primary schools in 2009-2010 school term taking into consideration the school/program they finished, their classroom condition, classroom size and analysis in 2005.Curriculum. In the present study, survey design, one of descriptive designs in research methods, was conducted in which questionnaires prepared by the researcher were used in order to get teachers' views. The questionnaires were administered to 68 out of 74 Science and Technology Teachers teaching at 85 primary schools in towns and villages alike in Erzincan. The data were analysed through SPSS and the arithmetic means and standard deviations were measured. Mann-Whitney U test and Kruskal-Wallis test were conducted. The results of the study showed teachers' positive views on the Science and Technology Curriculum while they showed lack of knowledge about the curriculum, viability of, and exact practice of the curriculum.
Key words: Science and Technology Curriculum, Instruction, Science and Technology Teachers

INTRODUCTION

In the age of information and technology when scientific knowledge is becoming more and more of great importance, and the impact of science and technology is clearly observed in every part of life, it is obvious that Science and Technology Instruction plays a key role in the future of societies. All societies, specifically the developed ones, are constantly increasing the quality of Science and Technology Education. Therefore, there is a clear need to develop curricula in order to better understand and teach science.

The new of science curriculum prepared by a group of scientists has been seriously and academically investigated. A lot of effort was made to orientate successful students toward science. In the science curriculum, scientific applications and studies concerning students' daily lives form only a small portion. Considering such an approach, emancipation of thought, discussed widely in the 19th century was replaced by researching and investigation. The main aim of the scientific world is to raise a society of knowledge in order to have a positive view on the scholars and their works (Yeşildağ, 2009).

Rapid developments in science and technology as well as the process of change made a significant impact on curriculum development. While determining the content and strategies of Science and Technology curriculum, this quality was taken into consideration. Science and Technology is not only a sum of realities about the world but also a way of research and thinking based on empirical measures, critical

thinking and constant investigation. Therefore, in teaching Science and Technology, the objective is to help individuals to learn to reach information directly through investigation, revise and reconstruct his/her world view as she/he learns and improves his/her wish to learn. A myriad of significant changes in the field of curriculum development were reported particularly in the USA, the Netherlands, England and Germany (Halat, Doğan and Marulcu, 2005).

In Turkey, the Ministry of National Education initiated a project and some changes were made in the first stage of primary schooling the content of Science and Technology Curriculum as were made in other fields of study in 2004. Researches made on Science and Technology curriculum in 2005 (Akbaş, 2006; Bulut, 2006; Gömleksiz, 2005; Bukova-Güzel and Aklan, 2005; Gözütok, Akgün and Karacaoğlu, 2005; Erdoğan, 2005; Ercan and Altun, 2005; Özdemir, 2005 Yıldırım, 2006;) drew attention in this sense.

Teachers play an important role in the realization of the foreseen instructive practices in a teaching programme. Teacher's confidence and self-commitment in the practice of the curriculum, his/her knowledge about it beside his/her efforts to conduct the activities planned are to be taken into consideration. Therefore, it was thought that it would be essential that the efficiency of practice in Science and Technology Curriculum be assessed in 2004-2005 school term based on the views of primary school teachers who taught the curriculum (Gömleksiz and Bulut, 2006). After a year following the application of the curriculum, student-centred curriculum conduct, emphasis on experiments and observation, learning through experience orientation of students toward research, simplification of subject levels, integrated units and interest of students in science curriculums proved that the practice of curriculum was of a great success (Buluş, Kırıkkaya 2009).

The improvement of quality in education has been one of the main pursuits of educational institutions. All educational activities are carried out within the framework of syllabi prepared before hand in both formal and continuous education. What is to be gained at the end is determined and stated in this content. Thus, the quality of education is majorly dependent on the content applied. As the short comings and flaws of the curriculum content are amended or completed in accordance with the developments in scientific fields, the quality of education is also expected to increase (Erden, 1998, 2). Curriculum syllabi should constantly be evaluated during and after the practice, and the observed shortcomings should be completed so that the constant improvement and transformation of the content are assured (Aykaç and Başar, 2005, 344).

The aim of the present study is to determine teachers' views on Science and Technology Course syllabus. In this respect, the research showed whether there were any significant differences in teachers' general views of Science and Technology curriculum teaching at primary schools in 2009-2010 school term taking into consideration the school/program they finished, their classroom condition, classroom size and analysis in 2005.

Methodology

Research Design

One of descriptive designs, survey design was used in this study.

The participants of the Study

68 science and technology teachers teaching at different primary schools in Erzincan during 2009-2010 school semesters participated in the study.

Instrument

In the study, considering the goal, content and gains of the Science and Technology curriculum". Analysis of Teachers' Views of Science and Technology Curriculum" scale was used.

Data Analysis

In the analysis of the data collected in the research, different statistical analysis such as arithmetic mean, standard deviation, Mann-Whitney U test and Kruskal-Wallis test were used. SPSS for Windows 12.00 program was used for the analysis of data..

Findings and Results

The arithmetic mean and standard deviation values are given in Table 1.1 that explains the teachers' general views of Science and Technology curriculum in 2005.

Table 1 Findings related to teachers' general views of Science and Technology curriculum for 6th, 7th and 8th grades in 2005

	$\overline{X}$	Standard Deviation	Meaning
1- Science and Technology curriculumis qualified enough to teach students in parallel with the general aims of Turkish National Education.	4,18	0,597	Agree
2- Science and Technology curriculumcanresult inhappy, successful individuals adapting their environment.	3,93	0,676	Agree
3- Teachers have sufficient information about Science and Technology curriculum.	3,12	0,890	Undecided
4- Teachers' working load has increased in Science and Technology curriculum.	3,57	1,188	Agree
5- Science and Technology curriculum can be entirely put into practice.	3,24	1,121	Undecided
6- Science and Technology curriculum is more connected to real life.	4,16	0,704	Agree
7- Together with Science and Technology curriculum, families have become a part of the educational process.	3,40	0,949	Undecided

Table 1shows teachers' views of Science and Technology curriculumin 2005 as "agree" in the 1st, 2nd, 4th and 6thitems while as "undecided" in the 3rd, 5th and 7thitems.

Table 2 Findings related to teachers' general views of Science and Technology curriculum for 6th, 7th and 8th grades in 2005 in accordance with "the school/ program they graduated from:"

	Program of graduation	n	Mean Rank	Chi-square	Difference
1- Science and Technology curriculum is qualified enough to teach students in parallel with the general objectives of Turkish National Education.	Teacher's Training School	1	59,50	4,802	
	Training Institute	3	28,00		-
	Degree Completion Programme	3	38,50		
	Primary School Teaching, Faculty of Education	2	14,50		
	Four-Year Bachelor's Degree	59	34,88		
2- Science and Technology curriculum can result inhappy, successful individuals adapted to their environment.	Teacher's Training School	1	63,00	6,056	
	Training Institute	3	26,83		-
	Degree Completion Programme	3	45,00		
	Primary School Teaching, Faculty of Education	2	5,00		
	Four-Year Bachelor's Degree	59	34,87		
3- Teachers have sufficient information about Science and Technology curriculum.	Teacher's Training School	1	54,00	1,530	
	Training Institute	3	32,17		-

	Degree Completion Programme	3	32,17		
	Primary School Teaching, Faculty of Education	2	42,75		
	Four-Year Bachelor's Degree	59	34,13		
4- Teachers' work load has increased in the Science and Technology curriculum.	Teacher's Training School	1	38,50	3,394	-
	Training Institute	3	24,50		
	Degree Completion Programme	3	11,00		
	Primary School Teaching, Faculty of Education	2	35,25		
	Four-Year Bachelor's Degree	59	36,11		
5- Science and Technology curriculum can be entirely put into practice.	Teacher's Training School	1	65,00	3,368	-
	Training Institute	3	29,50		
	Degree Completion Programme	3	29,50		
	Primary School Teaching, Faculty of Education	2	15,25		
	Four-Year Bachelor's Degree	59	35,14		
6- Science and Technology curriculum is more related to real life.	Teacher's Training School	1	58,50	2,643	-
	Training Institute	3	27,50		
	Degree Completion Programme	3	27,50		
	Primary School Teaching, Faculty of Education	2	31,75		
	Four-Year Bachelor's Degree	59	34,90		
7- Together with Science and Technology curriculum, families have become a part of educational process.	Teacher's Training School	1	48,00	5,600	-
	Training Institute	3	25,00		
	Degree Completion Programme	3	40,33		
	Primary School Teaching, Faculty of Education	2	48,00		
	Four-Year Bachelor's Degree	59	34,00		

The table above reveals that all chi-square values regarding all the items were insignificant (p>0.05). These findings show that there is no difference in teachers' views regarding the survey items in accordance with the school/programme they graduated. The table analyzed, it is clearly seen that the mean rank of teachers' views graduating from different programmes regarding all items was found to be high. The results show that all the teachers have positive views.

Table3 Findings related to teachers' views of Science and Technology curriculum for 6th, 7th and 8th grades in 2005 in accordance with "classroom condition in which they taught in 2009-2010 school term:"

	Grade	n	Grade Arithmetic mean	Chi-square	Difference
1- Science and Technology curriculum is qualified enough to teach students in parallel with the general aims of Turkish National Education.	6	5	46,90	10,7000*	4-8
	7	5	40,60		6-8
	8	2	3,50		7-8
	6,7,8	56	33,96		
2- Science and Technology curriculum can result in happy, successful individuals adapting their environment.	6	5	30,30	0,952	-
	7	5	29,10		
	8	2	36,00		
	6,7,8	56	35,30		
3- Teachers have sufficient information about Science and Technology curriculum.	6	5	45,00	4,819	-
	7	5	36,80		
	8	2	11,00		
	6,7,8	56	34,20		

4- Teachers' working load has increased in Science and Technology curriculum.	6	5	27,50	5,181	-
	7	5	27,50		
	8	2	11,00		
	6,7,8	56	36,59		
5-Science and Technology curriculum can be entirely put into practice.	6	5	46,70	8,458*	4-8
	7	5	26,90		6-8
	8	2	3,00		
	6,7,8	56	35,21		
6- Science and Technology curriculum is more related to real life.	6	5	33,70	4,815	-
	7	5	39,90		
	8	2	58,50		
	6,7,8	56	33,23		
7- Together with Science and Technology curriculum, families have become a part of educational process.	6	5	37,50	3,154	-
	7	5	22,60		
	8	2	48,00		
	6,7,8	56	34,81		

(*) $p<0.05$ significant

The table analyzed, the chi-square values regarding the 1st and 5th items were found to be significant ($p<0.05$) while the chi-square values regarding the other items were found to be insignificant ($p>0.05$). These findings show that there is difference between the teachers' views of the item "Science and Technology curriculum is qualified enough to teach students in parallel with the general objectives of Turkish National Education" and the item "Science and Technology curriculum can be entirely put into practice." In order to understand the reason for the difference, Boenferroni paired comparison test was carried out. When the table is analyzed, the difference between the views of teachers of 8th grade and those of the 4th, 6th and 7th grades regarding the 1st article was significant at a level of $p<0.05$. Similarly, the difference between the views of teachers of 8th grade and those of the 4th and 6th grades regarding the 5th article was significant at a level of $p<0.05$. In the table, it can be seen that the line average of the views of the 8th grade teachers regarding both articles was lower than those of the other teachers. As a result, it can be said that most positive views regarding these two articles were presented by teachers of the 6th grades while teachers of the 8th grades presented the highest number of negative views.

Table 4 Findings related to teachers' views regarding the curriculum of Science and Technology for 6th, 7th and 8th grades in general in 2005 in accordance with "the classroom size:"

	Classroom Size	n	Line Average	Chi-square	Difference
1- The Science and Technology Curriculum is qualified enough to teach students in parallel with the general aims of Turkish National Education.	0-20 people	18	33,64	3,060	-
	21-30 people	40	35,61		
	31-41people	7	37,00		
	41-51 people	3	19,00		
2- The Science and Technology Curriculum can grow happy, successful individuals adapted to their environment.	0-20 people	18	34,00	9,031*	0-20 - 41-51
	21-30 people	40	36,61		21-30 - 41-51
	31-41 people	7	35,86		31-40 - 41-51
	41-51 people	3	6,17		
3- Teachers have sufficient information about the Science and Technology Curriculum.	0-20 people	18	33,53	2,715	-
	21-30 people	40	36,05		
	31-41 people	7	35,29		
	41-51 people	3	17,83		
4- Teachers' working load has increased in the Science and Technology Curriculum.	0-20 people	18	30,50	5,539	-
	21-30 people	40	34,05		
	31-41 people	7	49,57		
	41-51 people	3	29,33		
5- The Science and Technology Curriculum can be	0-20 people	18	26,72	4,341	

entirely put into practice.	21-30 people	40	37,90		-
	31-41 people	7	35,57		
	41-51 people	3	33,33		
6- The Science and Technology Curriculum is more connected to real life.	0-20 people	18	31,89	3,226	-
	21-30 people	40	36,30		
	31-41 people	7	37,14		
	41-51 people	3	20,00		
7- Together with the Science and Technology Curriculum, families have become a part of educational process.	0-20 people	18	33,47	1,822	-
	21-30 people	40	35,94		
	31-41 people	7	34,71		
	41-51 people	3	21,00		

(*) p<0.05 significant

When the table is analyzed, the chi-square value regarding the 2[nd]item was found to be significant (p<0.05) while all the chi-square values regarding the other items were found to be insignificant (p>0.05). These findings show that there is difference between the teachers' views regarding the item "Science and Technology Curriculum can grow happy, successful individuals adapted their environment." In order to understand what this difference results from, Bonferroni paired comparison test was carried out. Regarding this item, the mean ranks of teachers' views who had a class of 41-51 students was higher while mean ranks of teachers' views who had classes of 0-20 students, 21-30 students and 31-41 students was lower. As a result, teachers who had a class of 41-51 students had more negative views regarding the item than other teachers.

Table5 Findings related to teachers' generalviews regarding the Curriculum of Science and Technology for 6th, 7th and 8th grades in 2005 in accordance with "the analysis condition of the New Science and Technology Curriculum:"

	Analysis Condition	n	Mean Rank	Rank Total	U
1- The Science and Technology Curriculum is qualified enough to teach students in parallel with the general aims of Turkish National Education.	Yes	60	34,65	2079,00	231,000
	No	8	33,38	267,00	
2- Science and Technology Curriculum can result in happy, successful individuals adapting their environment.	Yes	60	35,35	2121,00	189,000
	No	8	28,13	225,00	
3- Teachers have sufficient information about Science and Technology Curriculum.	Yes	60	34,01	2040,50	210,500
	No	8	38,19	305,50	
4- Teachers' working load has increased in Science and Technology Curriculum.	Yes	60	35,10	2106,00	204,000
	No	8	30,00	240,00	
5- Science and Technology Curriculum can be entirely put into practice.	Yes	60	35,53	2131,50	178,500
	No	8	26,81	214,50	
6- Science and Technology Curriculum is more connected to real life.	Yes	60	34,26	2055,50	225,500
	No	8	36,31	290,50	
7- Together with Science and Technology Curriculum, families have become a part of educational process.	Yes	60	33,61	2016,50	186,500
	No	8	41,19	329,50	

When the table is analysed, in accordance with the analysis condition of the new Science and Technology Curriculum, all the U levels related to the articles regarding Science and Technology Curriculum in 2005 were found to be insignificant (p>0.05). These finding show that in accordance with the analysis condition of the new Science and Technology Curriculum, there was no difference between the teachers' views of Science and Technology Curriculum in 2005.

Conclusion and Suggestions

Considering that teachers graduating from different programmes acknowledged positive views regarding the curriculum in general, it is suggested that in-service training curriculum following the application of the curriculum were productive and (or the teachers were constantly interested in the curriculum. However, although the teachers had sufficient knowledge about the curriculum, they noted that they were incompetent in its viability. In order for teachers to apply the curriculum efficiently, the classrooms are expected to consist of 20 students. This shows that the curriculum requires more individual activities to be carried out.

One of the most important results was that teachers teaching the 8th grade students had negative views about curriculum. These teachers deal with the curriculum as a part, not as a whole. However, when the curriculum is analyzed, it is seen that the students had concepts that controlled their preliminary knowledge. Constant information exchange especially between the students of the 6th, 7th and 8th grades can solve these problems. Moreover, it will be useful if the teachers not only benefit from the sources sent to the schools but also examine the website of the Ministry of Education.

References

Akbaş, O., "An Analysis of the Primary Education Curriculum", (288–303), *the Notification Book for the National Congress of Classroom Teaching,* Volume 2 (261-268). Ankara: Kök Publishing. (2006).

Aykaç, N.; Başar,E. "Assessment of Primary Curriculum of Social Sciences", *Reflections in Education: VIII Symposium of the Assessment of New Primary Education Curriculum,* 14-16 November, Erciyes University Sabancı Cultural Site, Kayseri, p. 343-345. (2005).

Bukova-Güzel, E. and Alkan, H. "An Assessment of the Pilot Scheme of the Reconstructed Primary Education Curriculum**",** *Journal of Educational Sciences in Theory and Practice,* 5 (2), 385-420. (2005).

Bulut, İ. An Assessment of the Efficiency of 1st Level Primary Education Curriculums in Practice, (Published Doctorate Thesis), *Fırat University, Institute of Social Sciences*, Elazığ. (2006).

Buluş Kırıkkaya E., "Views of Primary School Science Teachers regarding the Science and Technology Curriculum' *Journal of Turkish Science* Year 6, Issue 1, April (2009).

Erden, M., Curriculum Assessment in Teaching, (3rd Edition). **Ankara: Anı Publishing.** (1998).

Erdoğan, M., "New Curriculum of 5th Grade Science and Technology Class: Reflections of Pilot Scheme", *Reflections in Education: the Notification Book for VIII Symposium of Assessing New Primary School Curriculums,* (p. 299–310). Ankara: Sim Press. (2005).

Gömleksiz M. N., "An Assessment of the Efficiency of the New Primary School Curriculum in Practice", *Journal of Educational Sciences in Theory and Practice,* 5 (2), 339-384. (2005).

Gözütok, F. D., Akgün, Ö. E. and Karacaoğlu, Ö. C., "Assessment of Primary Education Curriculums in terms of the Competency of Teachers", *Reflections in Education: the Notification Book for VIII Symposium of Assessing New Primary School Curriculums* (p. 17–40). Ankara: Sim Press. (2005).

Halat, E., Doğan, M. and Marulcu, "Ideologies of Prospective Teachers about the Curriculums", *XIV National Congress of Educational Sciences 1st Volume* (p. 573-581), Pamukkale University Faculty of Education, Denizli. (2005).

Özdemir, M. S., "Views of Primary School Science Teachers regarding the Science and Technology Curriculum (I-V grades)" *XIV National Congress of Educational Sciences* (p. 573-581), Pamukkale University Faculty of Education, Denizli. (2005).

Yeşildağ, F., "Perceptions of Students regarding Multiple Modal Descriptions in Modern Physics Teaching and the Influence of Assessment Process for the Writing Activities Prepared by Modal Descriptions"(Published Master Thesis, *Atatürk University, Institute of Science*, Erzurum. (2009).

Yıldırım, M. C., "An Assessment of the New Primary Education Curriculum", *the Notification Book for the National Congress of Classroom Teaching,* Volume 2 (261-268). Ankara: Kök Publishing. (2006).