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Expectations of Primary Teachers and Inspectors about the New Science and Technology Curriculum in Turkey

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ABSTRACT

As it is known, education-instruction activities are executed in educational institutions according to predetermined programs prepared by education specialists. Instruction programs play an important role for the social, cultural, political and economic development of societies. Also, recent developments in science and instruction technologies and new approaches to education-instruction force the curricula to change. In this context, it is possible to observe an educational breakthrough in Turkey as well since the last fifteen years. In parallel with this, science curricula are being reviewed for the third time. This study is based on necessity analysis reports obtained by the Ministry of National Education from 79 provinces of Turkey for the evaluation of the Curriculum for the Natural Sciences of the Year 2000. Findings of the research were obtained via documentary analysis method. The reports analyzed in this study are prepared by 79 commissions consisting of 68 primary school inspectors and 348 teachers teaching the course concerned. In these reports, the Curriculum for the Natural Sciences of the Year 2000 is appraised in six main matters.

It is hoped that the findings obtained by researchers with the categorization of the data and the suggestions made in this study will contribute to future curriculum development studies.

Keywords: Natural Science Curriculum; Curriculum; Curriculum Development; Instruction Program; Program Development.

INTRODUCTION

The developing technology requires the courses to become more interesting in order to transfer the constantly increasing information for students and to increase the motivation of students. The main aim of the education must be to bring up free, self-confident new generations who would be the custodians of the future and who would be conscious of their duties and responsibilities to the Republic of Turkey, which is a democratic, secular and social state and in which the principle of supremacy of law is essential (Yalçınkaya Akyüz, 1998). For this reason, there is a need for education-

instruction programs conforming to the social, political, cultural and economic structure of the Turkish Society. As the education is considered to be a way of deliberate culturation, the education programs have to be planned (Demirel, 2004). In a professional sense, the necessity for the education to be planned and organized and it requires every single step of the education to be attached to certain programs (Küçükahmet, 1997). For this reason, since the very first years of the Republic, curriculum development studies have gained a particular importance.

Education-instruction activities are executed in education institutions according to predetermined programs. The education program is an essential component of the education system which plays an important role in the social, cultural, political and economic development of the society and in the self-realization of the individuals (Gözütok, 2003). The quality of the education given and its execution in a planned and systematic way is directly linked to the quality of the instruction program applied.

Nowadays in some scientific publications, the meanings of the words “curriculum” and "instruction program" are often confused. In order to clarify this issue, it would be useful to analyze these concepts step by step, beginning from the meaning of the word “program”. “Program” can be defined as being a document which shows the method, attitude or form for works to be done according to certain conditions or order for a specific subject and also the order or content of the works to be done in the future. An “education program” can be considered as a plan showing the aim, the parts, the method and the system of a specific study. On the other hand, an “instruction program” can be defined as being studies comprising the content, the duration, the education experiences and the assessment processes of courses on a certain scale of instruction (Türkeli, 2002). The instruction programs comprising the philosophy of a curriculum and reflecting it to the related course in an organized way are concerned with “what to be taught” to the students; on the other hand, the instruction methods and techniques are concerned with “how they would be taught”. The “program development” includes the process of designing, execution, evaluation of the program and its review and in some way its rearrangement according to the data obtained via evaluation. According to Demirel (1996) the program development can be defined as an ensemble of dynamic relations between the aim, content, learning-instruction process and evaluation components of an education program. In that sense, program development requires constant renovation and amelioration efforts (Çelenk, 2002). Also, it is executed when the existing applications appear to be insufficient and in order to satisfy an emerging need or to offer a new option (Çeliköz, 2004).

Before going to the "aim" and "methodology" parts, it would be useful to introduce briefly the Instruction Program of the Natural Sciences Course in Elementary Schools in the year 2000. In that program, some areas of learning are not defined. Another interesting characteristic of the program is that the general aims are not linked with the acquisitions. The chapters and the repartition of the number of acquisitions according to classes of the Instruction Program of the Curriculum of the Natural Sciences of the Year 2000 in Elementary Schools are shown in Table 1.

Table 1. *The Chapters and the Repartition of the Number of the Acquisitions According To Classes of the Instruction Program of the Curriculum of the Natural Sciences of the Year 2000.*

Class	Unit Nu.	The Name of Unit	Number of Acquisitions
4	1	Let Us Recognize Our Environment	26
	2	Nature Of The Substance	39
	3	Alive's Various	15
	4	Our Planet	17
5	1	Vivids and Their Interactions With Nature	27
	2	Sound And Light	42
	3	Heat and The Journey Of Heat In The Substance	19
	4	Motion and Force	18
6	1	The Journey To Interior Structure Of Vivid	28
	2	What Are There In My Body? How We Perceive The Environment?	66
	3	The Electricity That Directing Our Life	30
	4	We Are Exploring The Space	23
7	1	The Journey To Interior Structure Of Substance	17
	2	The Meeting Of Force And Motion: Energy	32
	3	If The Pressure Isn't Become…	25
	4	Let Us Recognize And Protect Our Blue Planet Which Partner Nest With Whole Vivids	30
8	1	Change In Substance And Energy	8
	2	Substance And Energy For Vivids	31
	3	Genetics	35
	4	Reproducing And Development In Vivids	28
	5	Magnetism, Affecting Our Life	20
Total	**21**		**576**

METHODOLOGY

This study consists of findings obtained through the documentary analysis of reports required by the Ministry of National Education (Talim Terbiye Kurulu Başkanlığı) from different cities. The Ministry of Foreign Affairs, via an act published on 24th October 2003 (Nu.: B.08.0 TTK.001.01.01/00111570), asked for an evaluation of the Year 2000 Natural Sciences Course Teaching Program from commissions to be composed by primary school inspectors in all the cities. For this reason, the Ministry determined 6 main criteria for the evaluation and asked them to send it as an open-ended report.

1. The compatibility of the scope of the teaching program with the basic knowledge, skill, attitude and values that the course aims to give
2. The compatibility of the teaching program with regard to
   a) interclass links and transitions,
   b) procurement of the knowledge, skills, attitude and values as a prerequisite.
3. The compatibility of the scope of the teaching program according to the level of students
4. The completion of the teaching program in a predetermined amount of time
5. The compatibility of the given order of the units
6. Other important problems related to the curriculum

As it can be seen, it is asked to mention about other problems to be determined by the commissions in the last article. These obtained findings will be mentioned in the "Results and Suggestions" part. With the feedback offered in this study, it is aimed at contributing to the curriculum development studies. The distribution of the reports according to regions, provinces and number of members is given in Table 2.

Table 2. *The Distribution of Reports According to Regions, Provinces and Number of Members*

Name of Region	Number of Provinces	Number of The Members in The Commissions	
		Inspector	**Teacher**
Marmara Region	11	8	*58*
South & Southeast Anatolia Region	9	6	*36*
Eastern Anatolia Region,	13	7	*51*
Aegean Region	8	8	*49*
Black Sea Region	16	15	*62*
Mediterranean Region	9	9	*44*
Middle Anatolia Region	13	15	*48*
Total	**79**	**68**	**348**

Except for the provinces of Erzurum and Balıkesir, reports prepared by the commissions in 79 provinces (68 primary school inspectors and 348 natural sciences teacher) are evaluated via documentary analysis method, and some results are obtained by categorizing some answers given to open ended questions and comments.

FINDINGS

Findings obtained from the research are given in Table 3 (according to regions).

Table 3. *(%) Values of the Reply Categories According To Regions*

Categories	**Reply**	**% VALUES**							
		MAR (11)	**EAG (8)**	**MED (9)**	**MID (13)**	**STH (9)**	**EAS (13)**	**BLA (16)**	**Average % of TURKEY**
1. The scope of the teaching program is compatible with the basic knowledge, skill, attitude and values the course aims to give	*Yes*	54,55	87,50	66,67	53,85	55,56	84,62	81,25	69,14
	No	45,45	0,00	0,00	0,00	33,33	0,00	6,25	12,15
	Partly	0,00	12,50	33,33	46,15	11,11	15,38	12,50	18,71
	No comment	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Total %	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
2. a) Interclass links and transition are compatible.	*Yes*	45,45	50,00	22,22	15,38	22,22	53,85	25,00	33,45
	No	27,27	0,00	0,00	7,69	44,44	15,38	18,75	16,22
	Partly	27,27	50,00	77,78	76,92	33,33	30,77	56,25	50,33
	No comment	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Total %	99,99	100,0	100,0	99,99	99,99	100,0	100,0	100,0
b) The teaching program is compatible with regard to the procurement of knowledge, skill, attitude and values as a prerequisite.	*Yes*	36,36	75,00	22,22	23,08	55,56	46,15	50,00	44,05
	No	36,36	0,00	11,11	7,69	44,44	38,46	12,50	21,51
	Partly	0,00	12,50	55,56	69,23	0,00	7,69	37,50	26,07
	No comment	27,27	12,50	11,11	0,00	0,00	7,69	0,00	8,37
	Total %	99,99	100,0	100,0	100,0	100,0	99,99	100,0	100,0
3.The scope of the teaching program is compatible with the level of students.	*Yes*	36,36	25,00	0,00	61,54	11,11	15,38	43,75	27,59
	No	54,55	0,00	11,11	0,00	44,44	38,46	12,50	23,01
	Partly	9,09	62,50	88,89	38,46	44,44	46,15	37,50	46,72
	No comment	0,00	12,50	0,00	0,00	0,00	0,00	6,25	2,68
	Total %	100,0	100,0	100,0	100,0	99,99	99,99	100,0	100,0

Table 3. *Continued..*

4. The teaching programs are completed at the predetermined amount of time (The time is sufficient.).	*Yes*	0,00	0,00	0,00	7,69	0,00	0,00	6,25	1,99
	No	90,91	100,0	100,0	92,31	77,78	92,31	93,75	92,44
	Partly	9,09	0,00	0,00	0,00	22,22	0,00	0,00	4,47
	No comment	0,00	0,00	0,00	0,00	0,00	7,69	0,00	1,10
	Total %	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
5. The given order of the units is compatible.	*Yes*	18,18	0,00	0,00	0,00	0,00	0,00	0,00	2,60
	No	9,09	87,50	66,67	61,54	22,22	38,46	100,0	55,07
	Partly	72,73	0,00	0,00	30,77	44,44	30,77	0,00	25,53
	No comment	0,00	12,50	33,33	7,69	33,33	30,77	0,00	16,80
	Total %	100,0	100,0	100,0	100,0	99,99	100,0	100,0	100,0

MAR= Marmara Region AEG= Aegean Region MED= Mediterranean Region MID= Middle Anatolia Region
EAS= Eastern Anatolia BLA= Black Sea Region STH= South & Southeast Anatolia

1. The Compatibility of the Scope of the Teaching Program With Regard To the Procurement of Basic Knowledge, Skills, Attitude and Values

A segment of 69, 14 % of the Turkish population (average) think that the scope of the teaching program is compatible with the basic knowledge, skill, attitude and values the course aims to give. On the other hand, 18, 71 % think that the scope of the program is partially compatible with the basic knowledge, skill, attitude, and values the course aims to give.

2. a) The Compatibility of the Teaching Program With Regard To Interclass Links And Transitions

A segment of 33, 45 % of the Turkish population thinks that the teaching program is compatible with regard to the transitions and links between classes, a majority of 16,22 % think that it isn't. 50, 33 % of the sampling group think that the teaching program is partially compatible with regard to the transitions and links between classes.

b) The Compatibility of the Teaching Program With Regard To the Procurement of the Knowledge, Skill, Attitude and Values as a Prerequisite.

A segment of 44, 05 % of Turkish population think that the teaching program is compatible with regard to the procurement of knowledge, skill, attitude and values as a prerequisite; nonetheless, 21, 51 % think that it isn't.

3. The Compatibility of the Scope of the Teaching Program According To the Level of Students

A segment of 23, 01% of the Turkish population think that the scope isn't compatible with the level of students, a segment of 27,59 %, on the other hand, think that the scope of the teaching program is generally compatible with regard to the students' level. A segment of 46, 72 %think that it is partially compatible.

4. The Completion of the Teaching Program in a Predetermined Amount of Time

The most striking finding of the research is, without any doubt, the one which related to the esteemed duration. In only 1, 99 % of the commission reports (commissions consisting of 68 inspectors and 348 teachers in 79 provinces around Turkey) it is said that the programs are completed at the predetermined amount of time. Unfortunately, in 92 %

of the reports it is stated that the programs couldn't be completed at the predetermined time.

5. The Compatibility of the Given Order of the Units

In 55, 07 % of the commission reports it is stated that the given order of the units is not compatible. This finding is interesting. When we take into consideration the findings obtained from the second article, it can be said that the inter-subject relations are generally ensured between the units, but that there are some disharmonies while passing from one unit to another. If the students cannot make this link, they would hardly be successful even though the scope is compatible for the student. The most important cause of this is that the teaching program is not organized in conformity with the spiral structure.

6. Other Important Problems Related to the Curriculum

The findings obtained under this chapter are discovered following the categorization of other problems that the commission members needed to state in their reports. Only the most striking and interesting findings obtained are stated in this research. According to this, only 3, 78 %think that the teaching program gives the students the scientific research custom. 11, 74 % think that the program is student centred. Even though the intense program seems to be student centred and application oriented, the realization of the acquisitions becomes difficult when the program is fully implemented. With a country average of 38, 70 % it is stated that the physical conditions (materials, classrooms etc.) are not sufficient in the implementation of the program.

DISCUSSION

The important role played by the natural sciences in the development of countries is an incontestable fact (Koca & Şimşek, 2000). The basis for the social and environmental development is founded through the courses on natural sciences taken during the elementary school (Akgün, 1996). However, it is widely observed that a large portion of the students attending the courses on natural sciences are far from obtaining successful results in these courses. This being said, the success of the students in the courses on natural sciences depends directly on the success of the educational quality of these courses. It is in this perspective that particular importance is attributed to studies aimed at improving the level of success of the elementary and high school students in the courses on natural sciences. To people who keep their particular interest in natural sciences during their entire life, the teaching on natural sciences offered throughout the primary and higher education is an important part of the education that they could get in this field. In this context, to be able to raise the manpower of good quality required by the modern society, we need to improve and ameliorate the quality of the natural sciences (Kaptan, 1999).

Recent technological and scientific developments and the new approaches on education bring up a necessity for the syllabus to be abridged and to be altered. On the other hand, although the educators do not prefer the short syllabuses, falling behind of the requirements of the modern education system for the sake of longer and more comprehensive syllabuses cannot be accepted (Ünsal, 2004). Yet, opting for more dynamic curricula paves the way towards a society with a more dynamic structure (Koca & Şimşek, 2000). An improving and self-correcting education system turns into a system which produces positive effects on the cognitive and sensitive qualities of the students (Bloom, 1998). Instructors, curriculum and the students are altogether the three pillars on which the education system is founded. In short, a well-developed curriculum cannot solely ensure an education of good quality. The works devoted to improving the curriculum are an important process for providing the future generation with assets that

will help them to keep up with the upcoming developments in a changing environment. Since the proclamation of the Republic in 1923, the education system in Turkey has undergone significant changes in various occasions. Yet, a certain number of questions arise around the framework described above: To what extent these changes meet our society's needs in a world of continuing evolution (Semenderoğlu, 2002)? Should changing the curriculum be the only goal in this situation? Or should the objective be to establish a flexible structure that will meet the expectations of the educational community at a minimum level, which will introduce in turn new practices that will open the door to a bright future for our nation? These questions are worth of consideration, to which every single member of the educational community and even the individuals in the society have to find a good answer.

Until very recently, the Turkish national education system was focused on teachers and subjects of instruction, rather than on the students. A direct result of this understanding was that the kind of students raised by this education system were timid and impersonator, whereas they also learnt by heart what their teacher said and what was written in the book they read; instead of being accustomed to use of scientific methods in their researches while they should also have the qualities of a person who has a democratic and secular culture and who believes in social justice, who is respectful and loving for others. While the present system, at least in theory, supposes that every single student shall be educated in the light of his/her areas of interests, his/her skills and his/her wishes; when it was put into practice that wasn't the case (Gözütok, 2003). However, the recent efforts in improving the curriculum have had positive effects and hopefully at present we see that there are serious advances towards the standardization in the curricula (Ünsal, 2004; Yüksel, 2003).

The Curriculum for the Natural Sciences of the Year 2000 can be described as student-oriented to some extent. It should also be noted that in a student-oriented education, the roles attributed to both the students and the teachers gain a particular importance. According to this constructivist approach, the students and the teachers shall be aware of their attributed roles and they shall accomplish their functions in a milieu that is appropriately designed for this purpose. In this regard, when it comes to the questions and examinations offered in excess in the textbooks that are prepared in line with the Curriculum for the Natural Sciences of the Year 2000 and for the sake of the student-oriented approach, it is observed that the students were mostly unable to reply to these questions. A possible explanation to that can be found in the lack of clear and well-prepared examples on how to implement the activities described in the curriculum. Yet, an important role that a teacher shall fill in accordance with the constructivist approach is that he should intervene, if necessary, to help him/her to find his/her own answers to the questions in his/her mind. If the teacher doesn't act in this way, the student who is baffling with these questions under the heavy load of the curriculum risks also losing his/her motivation to the course. Moreover, this situation can even have an additional negative effect on the student and the student can lose his self-confidence (Ünsal, 2004).

An additional remark to make on the Curriculum for the Natural Sciences of the Year 2000 is that the improvements and the general purposes are not sufficiently linked, which results in hesitations regarding the categorization of different improvements under different subjects. In addition, the Curriculum for the Natural Sciences shall also be harmonized with curriculum of other courses such as mathematics and social sciences. It is hard to say that the Curriculum for the Natural Sciences of the Year 2000 has such above-mentioned features. An example to this is the fact that there have been many reports signed by the teachers, which state that the students have difficulties in applying their knowledge on mathematics such as graphics, equations etc. to problems asked in the

courses of natural sciences. This being said, the inclusion of some interesting topics in several units is worth mentioning as positive features of the curriculum.

An additional aspect of the above-mentioned curriculum is that it doesn't have a nature where all necessary components aren't offered as the parts of the same package. The lack of repetition and reinforcement of the subjects processed in previous chapters makes the learning process harder. Thus, the learning process is not fully achieved or the related knowledge is not built to a sufficient extent.

CONCLUSION

In this study, the insufficiencies of the Instruction Program of the Natural Sciences Course for the year 2000 are exposed via reports of teachers and elementary school inspectors. Positive and negative parts of certain instruction programs are reported in various researches realized before as well. (Taşar, Temiz & Tan 2002; Akdeniz, Yiğit & Kurt, 2002, Ardaç & Muğaloğlu, 2002; Savran, Çakıroğlu & Özkan, 2002, Bağcı Kılıç, 2003)

The fact that there are too many details in the units in the Year 2000 Natural Sciences Course Teaching Program and that some of the topics which have to be studied at high school level are studied at the second level of the primary school omits the fact that learning speed and capacities of students are different (Semenderoğlu, 2002). Also, the inconsiderable number of units in the Year 2000 Natural Sciences Teaching Program doesn't show that the topic intensity is decreased. Because the number of units has been reduced by putting together some of the related units but in fact the scope of the units has not been reduced.

SUGGESTIONS

According to the findings obtained following the research, following suggestions must be taken into consideration in the future curriculum development studies:

1. There has to be integrity, coordination between the units executing the program development works in the Ministry of National Education; the fields of duty and the responsibilities of each member of the program development commission of each area must be clearly determined and it must be ensured that they work in a planned and democratic way.

2. At the beginning of curriculum development process, need analysis researches must be done in order to explain why the instruction program is being developed.

3. Pilot applications and consequently evaluation works must absolutely be done for the instruction programs developed.

4. Teachers must be provided with information and skills about new instruction programs and implementation processes via in-service training.

5. Examples of instruction, measurement and evaluation activities, suggestions, guide documents which would suggest performance-based alternatives must be prepared and distributed to teachers. Activities required must be explained in a clearer and detailed way at the end of related units.

6. Teaching programs to be developed must give the students the opportunity to develop their scientific process skills besides increasing their science literacy.

7. In science teaching via scientific research in teaching programs, scientific-critical-relational-creative thinking and the nature of science must not only be stressed, but the

activities show that they are a viewpoint and philosophy of life must be explained in a spiral program development concept as well.

8. As the results of the education investments are obtained in a long term, the priority must be given to the resolution of physical infrastructure problems and the solidarity between the students-teachers-parents and school must be ensured.

9. The number of Natural Sciences Courses must absolutely be increased, and they must be at least 4 hours/week.

10. Instead of high cost experience sets required by the teaching programs, activities which could be done with materials which be can acquired from the close neighbourhood must be conceived and be suggested in the teaching program.

11. In the teaching program, general objectives and acquisitions must be sufficiently associated.

12. The units of Natural Sciences and Social Sciences Courses are currently being done in a rotation in 4th and 5th classes. This situation causes some ruptures between units and topics. In order to suppress this problem, separate class hours must be prepared for Natural Sciences and Social Sciences courses.

13. The 4^{th} and 5^{th} class Natural Sciences Course Teaching Programs must be prepared in order to form a basis for the 6^{th}, 7^{th} and 8^{th} class Natural Sciences Course.

14. Natural Sciences Course in the 4^{th} class must be taught by the branch teachers who graduated from education faculties as a natural sciences teacher.

15. The scope of the teaching program must be flexible, linked to daily life, actual, concrete and appropriate with the age and learning life of students.

16. Teacher's guide books related to the implementation of the teaching program must be prepared and they must be distributed to every teacher.

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