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Examining the 2018 Science Curriculum in the Context of the Basic Elements of the Curricula

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Abstract
The research aims to examine the science curriculum implemented in 2018 in terms of the four basic elements of the curriculum. In line with this purpose, 2018 science curriculum were evaluated in terms of objectives, content, learning-teaching process and measurement-evaluation elements. In this qualitative study, document analysis was used as one of the data collection methods. The data obtained in line with the research questions were presented under the themes of objectives, content, learning-teaching process and measurement-evaluation, which are the basic elements of curricula.
According to the results of the study, it can be said that the 2018 curriculum is similar in approach to the previous curriculum. It is seen that the innovative thinking skill, which was not included in the old curriculums, is included in the 2018 curriculum. In the 2018 science curriculum, there were no examples of activities and explanations were given for some learning outcomes, while no explanation was given for others. It was observed that the 2018 curriculum was weaker than the previous curriculum in terms of measurement-evaluation dimension. It can be stated that the previous curriculum had a richer and more useful content for teachers.

Keywords: Curriculum elements, *curriculum evaluation, science curriculum, 2018 curriculum.*

INTRODUCTION

Schools are the most important institutions that ensure the continuity of education in societies (Varış, 1996). The places where education and training processes are carried out can be schools and out-of-school places. Therefore, teaching is a broad field with a wide range of content that takes place in educational activities and has different dynamics (Nilsen, 2017). Teaching is all of the activities carried out in order to provide individuals with the desired behaviors (Babadoğan, 1996).

Attention is paid to direct educational activities in line with the needs of the age. Therefore, the education system of a country can have a great impact on the future of that country. In a time when technology is very important, it has become inevitable for societies that cannot keep up with rapidly advancing technological developments to experience social and economic problems (Varış, 1996). These countries lag behind developed countries in every field and have difficulty in reaching the desired quality in education. It will be very difficult for societies that do not have a sound education system to direct the future and reach modern goals (Akınoğlu, 2005).

The inclusive aspect of education, which is expressed as all the stages in the behavioral change of individuals in society, is also reflected in the education program. In this context, formal education can be defined as education processes carried out regularly (Ertürk, 1984). Within the education system, course contents are regulated by curricula. Curricula are systems that show what, how, why and with what to be taught in a course and ensure that education is carried out as a whole within a plan and program (Bağcı Ayrancı & Mutlu, 2017). In this system, the curriculum can be

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considered as all the experiences offered to students under the control of the teacher (Caswell & Campbell, 1937). In Türkiye, the curriculum covers the activities related to students in order to achieve the objectives of the schools within the scope of the Ministry of National Education (Küçükahmet, 2009). The curriculum includes all educational activities planned for the determined purposes. This includes all teaching activities related to the subjects to be covered in different classes and courses in the education process (Demirel, 2013).

Curricula in Türkiye have been criticized for failing to create a questioning and inquiring thought system in students, for not providing each individual with unique skills, for not keeping students active in the process, for providing theoretical knowledge based on rote memorization, for not feeding on daily life and for being teacher-centered (Özdemir & Erzan, 2005, cited in Gelen & Beyazıt, 2007). Therefore, improving curricula will also increase the quality of education. In addition to the quality of the curriculum, the qualifications of the teachers who will implement it in the classroom are also very important. The current period requires both curricula and teachers to be in an effective structure (Girgin, 2011).

Curriculum development is defined as "a set of dynamic relationships between the objectives, content, learning-teaching process and evaluation elements of the curriculum" (Demirel, 2012). According to Erden (1998), curriculum development is the work of designing, implementing and evaluating an educational program and reorganizing it with the data obtained as a result of the evaluation after these stages. Öncül (2000) defined curriculum development as including the steps of specifying the general and specific objectives of teaching, selecting appropriate curriculum materials, determining teaching methods and evaluation tools, creating an official curriculum draft for each course, testing and finalizing them, continuously reviewing and evaluating the adopted curriculum, and improving it. When developing curricula, attention is paid to objectives, content, learning and teaching process, and evaluation.

In Türkiye, efforts have been made to renew curricula in different periods since the establishment of the republic. Comprehensive activities were carried out in 1924, 1926, 1936, 1948, 1948, 1962, 1983, 1990, 1998, 2004 to develop curricula in the field of primary education (Öksüz, 2015). Finally, studies on curriculum development were conducted in 2013, 2017 and 2018. The year 2004 is an important date in the development of curricula. With a change initiated in this year, the curricula of all courses were renewed and comprehensive changes were made.

In line with the changing philosophy of the Ministry of National Education, efforts to develop, renew and update curricula started on a new track in 2005 and were completed in the 2015-2016 academic year. Since the beginning of the 2016-2017 academic year, a comprehensive renewal work has been carried out on 51 curricula, taking on a different dimension. The draft curricula prepared by the General Directorate of Basic Education, the General Directorate of Secondary Education and the General Directorate of Religious Education were submitted to the Presidency of the Board of Education on a timetable starting in November 2016 after a year and a half of intensive and comprehensive work. The draft curricula approved by the Board of Education were submitted to the Minister of National Education and received his approval on May 02, 2017. In 2017, a number of changes were made to the programs published in 2018 and the latest and up-to-date curricula were published in 2018. In 2018, the programs published by the Ministry of National Education are currently being implemented in all schools in Türkiye.

When the literature is examined, it is seen that studies have been conducted on the examination and comparison of various curricula (Albuz & Demirci, 2018; Ataş & Bümen, 2023; Bağcı Ayrancı & Mutlu, 2017; Karatay, Timur, & Timur, 2013; Oğuz & Akhun, 2015; Sağlamöz ve Soysal, 2021; Selvi, 2018; Tay & Baş, 2015). It is noteworthy that the 2005 and 2017 Turkish and Social Studies curriculum are mostly compared in the studies and the old and new curricula are compared from different points. Considering the studies conducted in the field of science, Ataş and Bümen (2023) investigated the analysis of 2005, 2013 and 2018 science curriculum in terms of curricula design principles. Karatay, Timur, and Timur (2013) compared the 2005 and 2013 science curriculum. Sağlamöz and Soysal (2021) examined the learning outcomes in the 2018 science curriculum

according to Bloom's taxonomy. In the current study, the basic elements of the curriculum were taken as a basis and the 2018 science curriculum was examined according to the dimensions of objectives, content, learning-teaching processes and measurement-evaluation. In addition, the vision and approach of the curriculum were also included and examined. In the literature, there are not enough studies in which such a comprehensive curriculum review is included. In this context, it is thought that the study will contribute to the literature and will be a source for future curriculum evaluation studies.

Purpose of the Research

In the study, it was aimed to evaluate the science curriculum implemented in 2018 by taking into account the similar and different aspects of the curriculum compared to previous curricula. For this purpose, the 2018 curriculum was examined and evaluated in terms of the four basic elements of the curricula: objectives, content, learning-teaching process and measurement-evaluation. In order to achieve this general purpose, answers to the following questions were sought.

2018 science curriculum;

1. What are its characteristics in terms of the objectives element?

2. What are its characteristics in terms of content element?

3. What are the characteristics of the learning-teaching process element?

4. What are its characteristics in terms of measurement-evaluation element?

METHOD

The research was conducted in a qualitative research model to evaluate the 2018 science curriculum. Qualitative research can be defined as a research in which qualitative data collection methods such as observation, interview and document analysis are used and a qualitative process is followed to reveal perceptions and events in a realistic and holistic way in a natural environment (Yıldırım & Şimşek, 2016). Accordingly, in this study, the science curricula published by the Ministry of National Education in 2018 were examined and evaluated.

Data Collection Tools

The research data were obtained using document analysis, one of the data collection methods in qualitative research. Document analysis involves the analysis of written materials containing information about the phenomena and events targeted to be researched. In qualitative research, document analysis can be a stand-alone data collection method or can be used together with other data collection methods (Yıldırım & Şimşek, 2016). Document review includes the examination of full texts of organizational, clinical or program records or excerpts from them, memoranda and correspondence, official publications or reports, personal diaries, written responses to open-ended questionnaires (Patton, 2014). In the study, the 2018 curricula books adopted by the Ministry of National Education, Board of Education and Instruction were used as documents. In addition, the literature on the subject was reviewed and scientific studies in this field were examined.

Analysis of Data

Descriptive analysis approach was used to analyze the data collected in the study. According to descriptive analysis, data are summarized and interpreted in line with predetermined themes. The results obtained can be given according to the themes that emerged in line with the research questions, or they can be given by considering the questions or dimensions posed in interviews and observations (Yıldırım & Şimşek, 2016). In this study, the data were given under the themes of objectives, content, learning-teaching process and measurement-evaluation, which are the basic elements of curricula, according to the aims of the research.

Ethical Issues

The study does not require ethics committee approval. Ethical principles were complied with during the publication process of the study.

FINDINGS

The findings regarding the 2018 science curriculum's objectives, content, learning-teaching process and measurement-evaluation elements are presented in line with the research questions.

According to the First Research Question "Examining the Objectives Element"

In line with the first research question, the characteristics of the objectives element were revealed. The vision of the 2018 science curriculum, as in the old curriculum, is to raise all students as science literate regardless of their individual differences. Since the name of the course was Science and Technology in the old curriculum, the concept of science literate was expressed instead of science and technology literate in the 2018 curriculum.

In the 2018 science curriculum, there was a significant decrease in the total number of learning outcomes. The total number of learning outcomes in the curriculum was determined as 327. In the old curriculum, there were 807 learning outcomes. It was revealed that there was a 60% decrease in the learning outcomes compared to the old curriculum. The number of learning outcomes in the 2018 science curriculum is shown in Table 1 with grade levels.

Table 1. The Number of Learning Outcomes in the 2018 Science Curriculum

Grade level	Number of learning outcomes
3th grade	36
4th grade	46
5th grade	36
6th grade	61
7th grade	78
8th grade	70
Total	327

When the total number of learning outcomes in the 2018 science curriculum is examined, it is seen that the number of learning outcomes generally increases as the grade level increases. There was a decrease from 4th to 5th grade and from 7th to 8th grade. It is noteworthy that the science learning outcomes were determined as 36 learning outcomes in 3rd grade, 46 in 4th grade, 36 in 5th grade, 61 in 6th grade, 78 in 7th grade and 70 in 8th grade.

According to the Second Research Question "Examining the Content Element"

When the content element is analyzed according to the second research question, it is seen that the number of subject areas has increased compared to the previous curricula. In the 2018 curriculum, the subject area of Applied Science was added to the subject areas of Living Things and Life, Matter and Change, Physical Phenomena, and Earth and the Universe. In addition, it is observed that there are changes in the subject areas and differences in the order. The name of the subject area "Matter and Change" in the old curriculum was changed to "Matter and its Nature". Accordingly, the location of the unit titles has also changed. In the 2018 curriculum, Science and Engineering Applications in grades 4-5 and Science and Engineering Applications and Entrepreneurship units in grades 6-8 were included. It is noteworthy that there is no change in the total number of lesson hours foreseen in the science curriculum.

In the curriculum, it is seen that the parts of the Science course related to mathematics are excluded from the content of the units. For example, the 6th grade curriculum does not include the unit and calculation of the concept of resistance and the curriculum includes the warning "mathematical relations are not included". On the other hand, the concepts of adaptation, mutation and modification were re-added as course outcomes.

According to the Third Research Question "Examining the Learning-Teaching Process Element"

In line with the third research question, the characteristics of the learning-teaching process element were revealed. According to the curriculum, the student should be active and the teacher should be a guide. In the learning process of science lessons, it is stated that the teacher will be encouraging and the student will be an individual who learns by doing actively in the classroom, researches the source of knowledge, discusses and transforms knowledge into a product. However, it is seen that the amount of information to be learnt specified in the learning outcomes is quite high compared to the course duration.

It is stated in the curriculum that the strategies to be chosen for organizing learning environments and making learning permanent may vary. However, in the 2018 science curriculum, it is underlined that these strategies should be designed according to the research-inquiry-based learning strategy, which was not mentioned in the old curriculum. It is noteworthy that in the curriculum, it is especially recommended to use informal learning in the learning-teaching process, learning should be carried outside the classroom to natural environments and the importance of generating arguments about the processes experienced is emphasized (MEB, 2018).

According to the Fourth Research Question "Examining the Measurement-Evaluation Element"

In the 2018 science curriculum, a measurement and evaluation approach has been adopted to monitor and guide students in the process, to identify and eliminate learning difficulties, and to provide continuous feedback in order to support meaningful and permanent learning. Among the important principles of the program are the meaningfulness of the numerical values obtained as a result, monitoring the student's development and guiding the student depending on this development. The learning and teaching process and measurement and evaluation practices should be coordinated and support each other. In the old curriculum, it was emphasized that not only the learning product (output) but also the learning process should be evaluated. In the 2018 curriculum, it is stated that measurement and evaluation practices can be handled in three stages: recognition, monitoring-formatting and result (product) oriented.

In the previous curriculum, there were too many explanations about measurement and evaluation. In addition to alternative techniques such as performance assessment, concept maps, structured grid, word association, project, poster group and peer assessment, and self-assessment, traditional assessment and evaluation techniques were also suggested. However, no suggestions were made at this point in the 2018 curriculum. As in the previous program, the assessment techniques that should be used for the gains are not specified.

CONCLUSION and DISCUSSION

It can be said that the 2018 curriculum is similar in approach to the old curriculum. In this context, it is seen that the curriculum adopts a student-centered, collective teaching and thematic approach. Although some courses seem to be thematic in the 2018 curriculum, it can also be said that it has a unit approach. Because learning areas have had the function of units in terms of grade levels.

When the curricula are considered with the dimension of objectives, while they were structured with target behaviors until the 2005 curriculum, learning outcomes were included with the 2005 curriculum. It is understood that this understanding is maintained in the 2018 curriculum. From a general point of view, the expression, which was referred to as target behavior in the programs where the behaviorist approach was adopted until the 2005 curricula, started to be referred to as learning outcomes in the curricula in 2005 and later. The main reason for this change in the 2005 curriculum is shown as the adoption of the constructivist approach (Tay & Baş, 2015).

In the 2018 curriculum, the innovative thinking skill is thought to replace the creative thinking skill in the previous curricula. Based on this assumption, it is necessary to know that creative

thinking is not the same as innovative thinking. As a matter of fact, while the meaning of the word creative is expressed as the ability to create, the word innovative means in favor of innovation. However, the English equivalent of the word creativity is creative and the word innovative is innovator. Creative thinking is defined as a way of thinking that is inventive, seeks innovation or brings new solutions to old problems and enables the emergence of original thoughts (Hançerlioğlu, 2000). Therefore, it can be said that the innovative thinking in the 2018 curriculum does not meet the creative thinking in the old curriculum and is incomplete in this sense.

When the 2018 curriculum's educational situations element was examined, it was determined that approximately one page of explanation was given in the curriculum books under the title of "issues to be considered in the implementation of the curriculum". At this point, it can be said that the 2018 curriculum is limited. Because in the old curriculum, explanations about learning-teaching processes were given in detail under the title of "learning-teaching processes and the role of the teacher".

In the 2018 curriculum, unlike the old curriculum, there are no examples of activities. While explanations are given for some achievements, no explanation is given for others. It can be stated that the 2018 curriculum also has limitations with this dimension. This finding coincides with the views of Arı (2016). Arı (2016) argues that the basic approach is not clear in the curricula developed after 2005. He states that there should be more explanations for practitioners in the curriculum. He also states that the achievement statements should be more qualified.

The fact that there is only one page of explanation about measurement and evaluation in the curriculum has caused a search for teachers. While different alternatives were offered to teachers in terms of measurement and evaluation techniques in the old curriculum, no suggestions were made in the 2018 curriculum. In addition, it is understood that the evaluation approach of the curriculum is aimed at measuring both the product and the process. It can be stated that the 2018 science curriculum with its measurement and evaluation element does not have a useful and rich content for teachers like the old curriculum.

Suggestions

In the 2018 science curriculum, it was determined that the achievements were reduced compared to the previous curriculum. The reason for this situation may be that the number of acquisitions is too high to be gained. In this context, it can be recommended to determine how much of the 2018 achievements to be implemented when determining the number of achievements in future programs and at what level.

In the 2018 curriculum, creative thinking skill, which was included in the previous curriculum, was not included. Considering the fact that this skill constitutes one of the indispensable characteristics of today's effective citizen, it may be recommended to add these skills that are not included in the program to the new curriculum. In addition, it is recommended that the skill of determining the cause-effect relationship, which is included in the 2005 curriculum within the scope of the skills to be given directly, be added to the new curriculum to be prepared.

In the 2018 curriculum, it is seen that there is a return to the pre-2005 curriculum understanding with the dimension of activity examples and explanations about the activities. It is thought that the lack of activity examples and explanations for these activities is a deficiency of the 2018 curriculum. In this context, it is recommended that the 2005 understanding be revived in the curricula to be renewed. As in the 2005 curriculum, measurement and evaluation tools should be included in the curricula to be renewed and developed in detail.

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