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Investigating the Acquisitions in the Science Teaching Program in terms of Life Skills

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Abstract

In parallel with the developing technology and knowledge, it has become very important for individuals to use various skills effectively. In Turkey, some life skills expected to be acquired by students are included in the 2018 Science Course Teaching Program. It is thought that determining included life skills and their levels in the acquisitions of the science-teaching program will be important in terms of literature. In the study, it was aimed to examine the acquisitions in the primary and secondary school science course-teaching program in terms of life skills. Document analysis, one of the qualitative research methods, was used in the study. As a data collection tool, the booklet of the Ministry of National Education 2018 Science Course Teaching Program was used. In the findings obtained from the study, it was determined that the acquisitions in the science program include the most analytical thinking and decision-making skills, the least creative thinking, entrepreneurship and teamwork skills. When the science-teaching program is examined, it can be said that the result is not surprising since it often includes expressions such as experimenting, developing projects, making conclusions, creating models, discussions and these statements require more analytical thinking and decision-making skills.

Introduction

The rapid changes in science and technology, the changing needs of the individual and society, innovations and developments in learning-teaching approaches directly affect the roles expected from individuals. As Karaer (2016) stated, societies need individuals who can investigate, question, solve problems, think critically, be assertive, closely follow the scientific and technological developments of the age, and represent themselves in the best way in international environments. In parallel with this situation, today's education-teaching activities aim not only to provide information to students, but also to gain skills about how to behave in situations they may encounter in their lives (Temizkan, 2014). In other words, the rapid increase of information in our age has brought individuals to take this information when necessary and appropriate for their purposes (Geçer & Özel, 2012). At this point, it is important that students have acquired the ways to access information and the necessary skills for this. As Yaz and Kurnaz (2017) stated, expectations from new generation individuals are increasing, and the need to raise science literate people in the field of science stands out first.

In terms of raising science literate individuals, many developed and developing countries have made innovations in the science course-teaching program. As Balbağ, Leblebicier, Karaer, Sarıkahya and Erkan (2016) stated, Turkey is trying to keep pace with other countries in science teaching and learning processes in order to adapt to the world in science education and teaching, to raise individuals who are open to innovations and who can use what they learn in all areas of life. At this point, the science course teaching program was updated again in 2018 in Turkey and the life skills were defined that competent individuals/students should have as required by the age. Science course teaching program defines an individual who is qualified to produce knowledge, use it functionally in life, solve problem, think critically, entrepreneur, decisive, has communication skills, empathetic, contribute to society and culture, etc. (Ministry of National Education-MoNE, 2018). These changes occurring in the skill field of the science course-teaching program are the result of the aim of equipping individuals with the skills they need today and they will in the future (Deveci, Konuş & Aydız, 2018). In this context, it can be stated that life skills are added and come to the fore in the science program in Turkey.

The concept of life skills is a concept that has been emphasized in recent years (Bolat & Balaman, 2017). Life skills are all of the vital skills that help people to deal with the difficulties that faced in their life and guide them in solving problems (Şimşek, 2019). In science course teaching program, life skills are defined as entrepreneurship, analytical thinking, creative thinking, decision-making, communication and teamwork (MoNE, 2018). In parallel with being a driving force in the development of the economy and welfare of society, entrepreneurship is one of the preliminary topics that many scientific disciplines have recently emphasized (Çelik, İnce & Bozyiğit, 2014). Indeed, countries need to train entrepreneurial individuals who are qualified, competitive, productive, equipped and able to meet the needs of the society in order to compete with other countries in socio-economic, political, etc. contexts (Çavdar, Cumhur, Koç & Doymuş, 2018; Yurtseven & Ergün, 2018a). However, with the competition conditions getting harder with each passing day, the importance given to organizational performance is increasing, individual-oriented practices are quickly abandoned and the organization structure is preferred to be team-oriented (Ergün & Eyisoy, 2018). At this point, the importance of teamwork and communication emerges.

In addition, analytical and creative thinking are other skills that are emphasized in the science course-teaching program. İşleyen and Küçük (2013) stated that the education system should be prepared in a way to reveal the creativity of individuals and enable them to train them creatively. As can be understood, the importance of life skills such as entrepreneurship, decision-making, analytical thinking and communication is emerging in the development of countries. In the acquisition of these skills, the necessity of including these skills in teaching programs is at the forefront. At this point, Deveci and Çepni (2017) state that there are many deficiencies in terms of how entrepreneurship education is included in the teaching program or in which teaching (field of education). In this context, it is considered that the degree to which these skills are included in the teaching program should be determined.

When the literature is examined, Erdoğan and Köseoğlu (2012) examined physics, chemistry and biology courses teaching programs/acquisitions in terms of scientific literacy; Kılıç, Haymana, and Bozyılmaz (2008) analyzed the science program in terms of scientific literacy and scientific process skills. In addition, science

course teaching program acquisitions was examined by Yaz and Kurnaz (2017) in terms of its suitability to Bloom taxonomy, by Ayvacı and Bebek (2017) in terms of model building and use, and by Arsal (2012) in terms of its compliance with the principles of constructivist learning theory. Güven (2010) analyzed the primary school life studies lesson programs in terms of entrepreneurship characteristics desired to be acquired by students. Moreover, the teaching programs of Life Studies, Social Studies, Turkish, Mathematics, Science and Technology courses were examined in terms of values (Güven, 2013), Turkish program in terms of basic skills (Temizkan, 2014) and social studies program in terms of skills (Aydemir & Adamaz, 2017). Most similar to the study conducted, Deveci et al. (2018) examined the acquisitions of the science course-teaching program in terms of their skills. Although there are similar studies, it is thought that it will be important for the literature to examine the 2018 science-teaching program in terms of life skills. However, although a rubric was used for the investigation of the program, it is thought that increasing the number of similar studies in this field is necessary in order to gain objectivity to the field, since the made evaluations contain subjective evaluations. In this context, the aim of the study is to examine the acquisitions in the science course-teaching program in terms of life skills (analytical thinking, creative thinking, decision-making, entrepreneurship, communication and teamwork). Accordingly, the sub-objectives of the study are;

- Determining the presence levels of the life skills (analytical thinking, creative thinking, decision-making, entrepreneurship, communication and teamwork) specified in the acquisitions of the middle school science teaching program,
- Examining the distribution levels of life skills emphasized in the acquisition of the middle school science course-teaching program according to subject area names (learning areas).

Theoretical Framework

Individuals must have basic skills as well as high-level skills and competencies in order to adapt to the changes that occur, to catch technology, to reach information by selecting, analyzing and evaluating, to use the information they obtain in their daily lives and to transform them into products (Anagün, Atalay, Kılıç & Yaşar, 2016). These skills are defined as life skills. Life skills are stated by Şimşek (2019) as skills that regulate interpersonal relationships in everyday life, help individuals in solving life problems, and are required at all ages, places and times. In science teaching program, these skills cover basic life skills such as analytical thinking, decision-making, creativity, entrepreneurship, communication and teamwork regarding the access to scientific knowledge and the use of scientific knowledge (MoNE, 2018).

Analytical Thinking

Analytical thinking can be expressed as breaking down the different aspects of something that can be an object, story or situation, classifying and understanding how to relate these components (Sitthipon, 2012). So analytical thinking is about breaking down situations, practices, problems, statements, ideas, theories or arguments (Thaneerananon, Triampo & Nokkaew, 2016) and it is the ability to identify correct intentions and outcome relationships between statements, questions, concepts, explanations or other forms (Prawita & Prayitno, 2019). At this point, analytical thinking includes the processes of disassembling the whole, redefining and classifying

them, and can be considered as a study of seeing the whole (Çelik, Gürpınar, Başer & Erdoğan, 2015). In this sense, analytical thinking means dividing events into causes, principles, and functions in order to establish relationships between topics, to sort problems and to organize problems (Montaku, 2011).

One of the ways to improve students' analytical skills is to create creative meaningful activities in which they will be more active in solving problems in their environment (Sasmitatias & Kuswanto, 2018). Because an uncertain situation that occurs requires the student to define or create a problem to solve, analytical thinking is required (Robbins, 2011). Analytical thinking process is the process of elaborating and analyzing information by using logic and reason, without relying on feelings or predictions, in order for students to understand information (Sukmaningthias & Hadi, 2016). In this context, it is thought that enabling students to break down a situation or a problem and find their relationships and offer solutions will have positive effects on the development of their analytical thinking skills.

Creative Thinking

Creativity can be defined as generating new concepts or ideas from the relationships between existing concepts with our observations, knowledge, experience or thoughts (Kılıç & Tezel, 2012). In this context, although creativity is different from intelligence (Kim, 2011), it can be considered both as a process and creating an original product at the end of this process (Aktamış & Ergin, 2007). Creativity means breaking down existing patterns, going out of the ordinary, exploring new ways, looking at life from different perspectives, revealing a new line of thinking, finding different alternative solutions for a specific problem, establishing a new relationship or establishing a relationship between existing thoughts (Özerbaş, 2011). Creative thinking, on the other hand, is a design and foresight approach, seeing the problems and gaps in knowledge, developing ideas and hypotheses, producing original ideas, seeing the relationship between ideas, obtaining new information by developing thinking components (Aktamış & Ergin, 2006). Creative thinking skills are the skills of individuals to use their minds to produce new ideas, new possibilities and new inventions based on originality in production (Daud, Omar, Turiman & Osman, 2012). In this context, creative thinking has an important place in terms of adapting to changing world conditions and contributing to change (Tok & Sevinç, 2012). As can be understood, although creativity and creative thinking are look-alike concepts, indeed they are different concepts. As Özerbaş (2011) stated, creative thinking mostly involves mental activities; creativity evokes both mental and performance-based activities.

Creativity is explained as a skill, attitude, way of thinking, product or process (Akcanca & Cerrah Özsevgeç, 2016). At this point, the emergence of different, original ideas and the fact that these ideas lead us to results positively affect the creative thinking process (Demirci, 2007). Creative thinking includes skills such as facilitating the learning of the individual by realizing his imagination, providing an opportunity for thinking, expressing his ideas easily, and providing new knowledge/something (Ersoy & Başer, 2014). Creative thinking enables problem solving or problem revealing in various fields and creates innovative and original solutions (Aizikovitsh-Udi & Amit, 2011). At this point, one of the most important parts in creative thinking is the introduction and implementation of the new and original idea.

Environments that reveal and support creative thinking in teaching can provide opportunities for students to create quality mental models about concepts by using their imagination skills (Atasoy, Kadayıfçı & Akkuş, 2007). At this point, efforts to minimize gaps of students based on academic abilities should be done in a way that can increase the quality of learning and the potential of students' creative thinking skills (Yusnaeni, Corebima, Susilo & Zubaidah, 2017). Because creative thinking can be included in learning by teachers, teachers should be able to fulfill the task of developing students' creative thinking skills (Zubaidah, Fuad, Mahanal & Suarsini, 2017).

Decision-Making

Decision-making is the process of choosing one or more of the most suitable and possible options from the option set based on at least one goal and a criterion (Abalı, Kutlu & Eren, 2012). Deciding on another statement is to make intelligent choices by trying objective, alternative ways among what is available, and what is presented (Gömleksiz & Kan, 2007). In this context, decision-making is the final product of the logical process in which doubts and discussions on the subject come to an end and the chosen path is implemented (Bolat & Balaman, 2017). Decision-making is more than choosing what to do, as it includes a logical commitment no matter how simple it may be (Asha & Al Hawi, 2016). At this point, it can be said that decision-making is a complex process that includes more than one thought process (Sever & Ersoy, 2019). As it can be understood, decision-making can be expressed as the process of choosing the right one among certain options in line with our purpose and using many skills in this process. As Saaty (2008) stated, decision-making includes many criteria and sub-criteria used to rank the alternatives of a decision. However, decision-making is not only the definition of these alternatives in the selection of alternatives, but the most appropriate one is realized together with our goals, desires, life style and values (Eraslan, 2015).

Decision-making behavior is an activity that begins with the awareness of a situation that needs to be decided and ends with the determination of an individual when and how to make a decision (Alver, 2005). In this context, the ever-increasing complexity of life, the diversity of interests and the problems encountered make it necessary to gain decision-making skills as a priority in primary education (Çakmakçı & Özabacı, 2013). Supporting decision-making skills at an early age and bringing them to life by associating them with life is important for individuals to become more determined individuals in their future lives (Deveci, 2019; Pekdoğan & Ulutaş, 2018). At this point, discussion/ argumentation is an important part of decision-making and there is a questioning of scientific and technological knowledge in this field (Patronis, Potari & Spiliotopoulou, 1999). In this context, it can be said that creating discussion environments in classrooms will be important for students' decision-making skills.

Entrepreneurship

Entrepreneurship is a multi-dimensional skill that includes features such as evaluating the opportunities that arise to meet the needs of the individual and planning and implementing them accordingly, recognizing the services and products that are developing as a market, taking the necessary risks and pursuing innovations in

this process, self-reliance and problem solving (Çetin, Şahin, Mertol, Arcagök & Girgin, 2017; Yurtseven & Ergün, 2018b). In other words, entrepreneurship is the ability to envision a course and create a graphic for a new business venture by combining information at the point that draws attention to the new business venture from the functional discipline and the external environment (Achor & Wilfred-Bonse, 2013). At this point, entrepreneurial skill includes risk awareness, creativity and the ability to discover and develop innovation in business and employment related activities (Othman, Othman & Ismail, 2012). The foundation of entrepreneurship is based on introducing innovative products or services by undertaking certain risks (Deveci & Aydın, 2017). In this context, entrepreneurship is a phenomenon that includes both innovation and creativity and must be assumed risk (Pan & Akay, 2015). Entrepreneurial individuals identify opportunities, gather the necessary resources, apply a practical action plan, and obtain the results at a certain time and in a flexible way (Gözek & Akbay, 2002). In this context, individuals with entrepreneurial skills have features such as self-confidence, risk taking, being able to come up with new ideas, and establishing good relationships (Ocak & Didin, 2018).

Considering the concept of entrepreneurship in an educational sense, it is necessary to acquire features that include entrepreneurial mentality, attitude and behaviors to individuals mostly at an early age (Deveci, 2018) because the inclusion of entrepreneurship skills objectives in the education system will enable young people to be entrepreneurial, innovative and creative (Emaikwu, 2011). Entrepreneurship education consists of all kinds of experiences that provides opportunities to students how to combine talent and vision and how to transform them into different opportunities (Anagün & Atalay, 2017). While entrepreneurship education is defined as preparing students for the business world in a narrow sense, it is defined as the process in which people gain a series of skills that can be applied in all areas of their lives and provide more personal, social and economic returns (Deveci & Çepni, 2015). At this point, the entrepreneurship characteristics of the students can be supported and improved with the projects and activities to be carried out in the courses.

Communication Skills

Communication is a complex process that consists of the perceptions, tendencies and attitudes of the speaker and the listener (Özata Yöre & Kanyılmaz, 2018) and can be defined as the interrelated message exchange between the two units (Aşçı, Hazar & Yılmaz, 2015). Communication skills, on the other hand, can be summarized as sensitivity to verbal and non-verbal messages, listening and reacting effectively (Erözkan, 2007). The concept of communication skills is naturally a reductionist process since suggesting complex behaviors such as conducting consultation or building relationships (Salmon & Young, 2011). Communication skills include verbal skills such as speaking, listening, reading and writing as well as using non-verbal communication skills such as body language and sign language effectively and in accordance with the environment (Köksal & Çöğmen, 2018). Communication skills consist the acquisition and transmission of information and concepts, including effective reading, listening, writing, and speaking (Burnett, 2003).

Throughout education, teachers and students can perform effective communication if they can use feedback effectively by constantly changing their roles as resources and targets in the communication process (Ocak &

Erşen, 2015). Communication skill is of great importance in terms of both education life and social and business life. Because individuals with advanced communication skills can cope with the difficulties and problems that they faced in their lives in a healthy way, establish effective relationships and be successful in their social and business lives (Bolat & Balaman, 2017; Dallı, Ünlü & Pekel, 2017; Özerbaş, Bulut & Usta, 2007). At this point, the importance of students expressing themselves, allowing them to explain their decisions, and conducting activities in this direction becomes evident in both individual and group studies.

Teamwork

When it comes to team, it is meant that the most skilled people who have good relations with each other come together to do a job, choose their own managers, and work together in solidarity (Kocabaş & Gökbaş, 2003). Teamwork, on the other hand, can be defined as working together for the identification of organizational goals, determination of methods and processes, and continuous improvement of organizations (Ergün & Eyisoy, 2018). In other words, teamwork is a way to improve the use of manpower and potentially increase the performance of the organization, not just the individual, because through collaboration, individuals can expand their output (Agwu, 2015). However, teamwork is difficult to quantify, as it has to be derived from numerous interrelated behaviors and attitudes (Britton, Simper, Leger & Stephenson, 2017).

Teamwork skill, on the other hand, is a skill that can be employed in all lessons and is necessary for the effective use of all strategies from collaborative learning to project-based teaching (Özata Yücel & Kanyılmaz, 2018). In this context, it is thought that methods such as collaborative learning and project-based learning that allow group work in educational environments will improve teamwork skills.

Method

This research is a qualitative study. Since the acquisitions in the science course-teaching program were examined in terms of life skills in the study, the method of document analysis was adopted. Document analysis is the process of collecting existing records and documents, encoding and reviewing them according to a certain norm or system (Çepni, 2018). In the study, it was deemed appropriate for document analysis as a method since the science lesson teaching program was examined according to certain norms in terms of life skills.

Data Collection Process and Analysis

The data of the study is composed of the science teaching programs of the 3rd, 4th, 5th, 6th, 7th and 8th grades of MoNE (2018). A total of 302 acquisitions were analyzed, 36 in the 3rd grade, 43 in the 4th grade, 36 in the 5th grade, 59 in the 6th grade, 67 in the 7th grade and 61 in the 8th grade in the teaching program.

The rubric for life skills was used in analyzing the data. The acquisitions are written in the rubric line and the reviewed life skills are written in the column section. Markings on which skills were included in the acquisitions were made by the researchers. The most important and emphasized point while making analyzes is what life

skills are and how they take part in acquisitions. One of the researchers played an important role at this stage, as he was a member of the commission in the preparation of science teaching programs. Discussions were held on what each skill is and how it can be expressed in the acquisitions.

As a result of the discussions and meetings, it was determined that analytical thinking skills can be used in situations such as modelling and comparing, discovering by experimenting, discussing the reasons of an event, drawing conclusions, making inferences, designing, proposing solutions, and questioning. Confusions have been experienced as to whether some statements in the acquisitions that will include analytical thinking skills require analytical thinking or only contain theoretical knowledge. As a result of the meetings held, final decisions were made by reading each acquisition over and over again and by examining the necessary points from the textbooks. A similar situation is valid for other life skills. It was concluded that creative thinking skills are included in the acquisition statements such as designing a model, generating new ideas, purposing suggestions, developing a new model/material, making exploration, and designing a project. When it comes to decision-making skills, it is thought that this skill can be used in situations such as in the project development process, in the discovery phase, in drawing conclusions by establishing relationships, in the process of making a new design, when doing research and presenting etc. In the meetings, it was concluded that entrepreneurship skills can be included in acquisitions that include features such as making a project or design that can be presented to the market, in the activities which includes social responsibility, making designs for the future, offering solutions to the existing environmental problem, and generating new ideas and suggestions. It is thought that communication skill can be included in acquisitions such as presenting, discussing, developing projects, and making predictions. In last, it has been concluded that teamwork can take place when they are asked to discuss ideas, research data, results, etc., when they are required to present the results of a research they have done, or in the acquisitions mentioned in-group work.

While conducting the analyses, first of all the acquisitions were read and the statement of acquisitions was tried to be mastered. Then, the acquisitions were emphasized one by one, and which skills included which acquisitions were evaluated. In the analysis of the data, which is the longest phase of the study, each acquisition was examined in detail in terms of each life skill and a joint decision was reached at the meetings. Analyzes were carried out by three researchers. While the common points remained the same, the points where differences occurred in the analyses were re-examined and a joint decision was made with the meetings held. In the analysis of the data, agreement between researchers was calculated as 86.92%. Descriptive analysis was used as it was aimed to examine the acquisitions in terms of life skills in the study.

Results

In this part of the study, findings related to two sub-problems are presented. First sub problem is “What are the levels of existence of life skills (analytical thinking, creative thinking, decision making, entrepreneurship, communication and teamwork) in the acquisitions in the middle school science course teaching program?” The second sub-problem is “What are the distribution levels of life skills emphasized in the acquisitions in the middle school science course teaching program according to subject area names (learning areas)?”

Findings Regarding the First Sub-Problem

The frequency-percentage values regarding the levels of life skills in the acquisitions included in the secondary school science course-teaching program are as given in Table 1.

Table 1. Frequency-Percentage Values Regarding the Level of Existence of Life Skills in Science Course Teaching Program Acquisitions

	3rd grade		4th grade		5th grade		6th grade		7th grade		8th grade		Total	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Analytic thinking	12	33.3	19	44.2	21	58.3	31	52.5	26	38.8	27	44.3	136	45.0
Creative thinking	3	8.3	4	9.3	10	27.7	7	11.9	9	13.4	9	14.8	42	13.9
Decision-making	14	38.9	19	44.2	18	50.0	29	49.2	27	40.3	28	45.9	135	44.7
Entrepreneurship	5	13.9	3	6.9	3	8.3	4	6.8	9	13.4	8	13.1	32	10.6
Communication	6	16.7	9	20.9	6	16.7	7	11.9	9	13.4	9	14.8	46	15.2
Teamwork	5	13.9	1	2.3	3	8.3	7	11.9	3	4.5	4	6.6	23	7.6
Total acquisition	45	125.0	55	127.9	61	169.4	85	144.1	83	123.9	85	128.8	414	137.1
Acquisition in the program	36	100.0	43	100.0	36	100.0	59	100.0	67	100.0	61	100.0	302	100.0

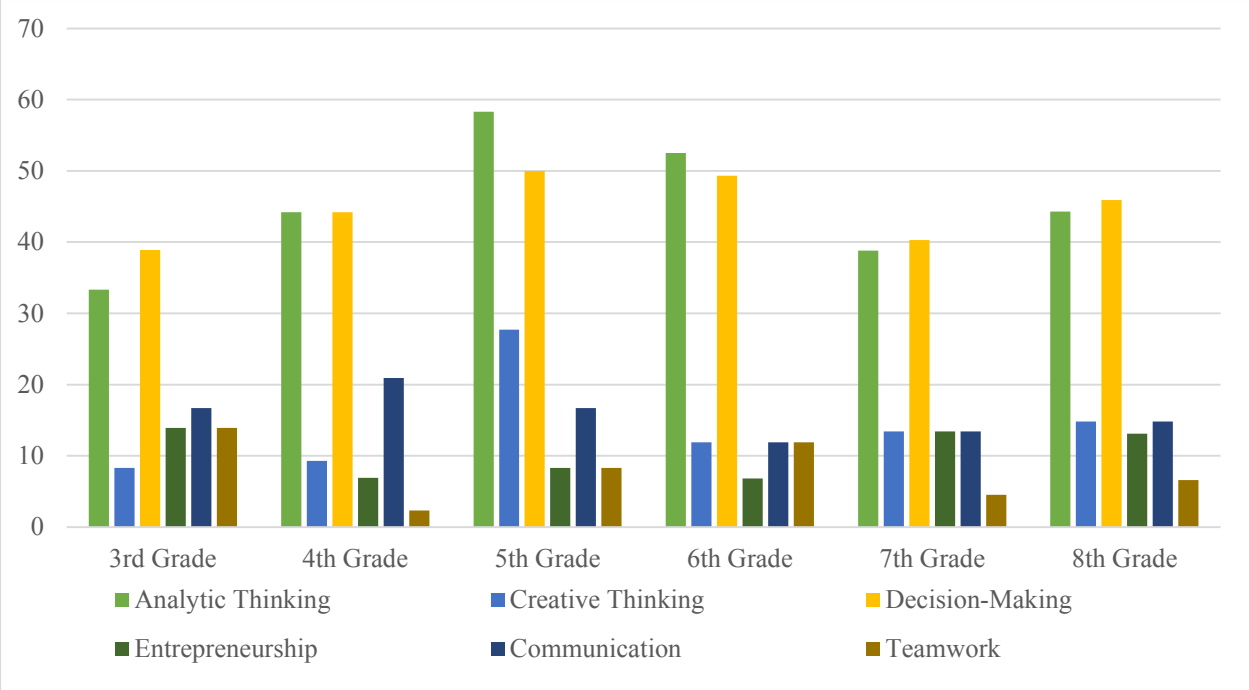
* Each percentage was calculated over the total gain at that grade level.

When Table 1 is examined, it was determined that analytical thinking skills are included in 33.3% in 3rd grade, 44.2% in 4th grade, 58.3% in 5th grade, 52.5% in 6th grade, 38.8% in 7th grade and 44.3% in 8th grade acquisitions. In this context, although analytical thinking skill is included in all levels, it is understood that it is included in the 5th grade at most, then in the 6th grade, 8th grade and 4th grade. When creative thinking skills are considered, they are found in 8.3% in 3rd grade, 9.3% in 4th grade, 27.7% in 5th grade, 11.9% in 6th grade, 13.4% in 7th grade and 14.8% in 8th grade acquisitions. At this point, it can be said that the creative thinking skill is placed in 5th grade at most, then in 8th grade and 7th grade. When it was considered in general, it can be stated that although creative thinking is less involved in the acquisitions, especially in lower-level classes, it does not take place much at all grade levels. It has been understood that another skill, decision-making, is placed 38.9% in 3rd grade, 44.2% in 4th grade, 50.0% in 5th grade, 49.2% in 6th grade, 40.3% in 7th grade and 45.9% in 8th grade acquisitions. It is seen that decision-making is mostly placed in 4th and 5th grades. However, it can be said that at all grade levels, almost half of the acquisitions are decision-making.

When we examine the entrepreneurship skill, it was concluded that it is placed 13.9% in 3rd grade, 6.9% in 4th grade, 8.3% in 5th grade, 6.8% in 6th grade, 13.4% in 7th grade and 13.1% in 8th grade acquisitions. In this context, it is seen that entrepreneurship skill is mostly included in 3rd, 7th and 8th grade acquisitions. However, in general, it can be said that the percentage of placement is not very high. Communication, another life skill, is found 16.7% in 3rd grade, 20.9% in 4th grade, 16.7% in 5th grade, 11.9% in 6th grade, 13.4% in 7th grade and 14.8% in 8th grade acquisitions. Although this skill is close to each other at all grade levels, it has been determined that it is placed in the 4th grade at most.

Finally, it was determined that teamwork was placed 13.9% in 3rd grade level, 2.3% in 4th grade, 8.3% in 5th grade, 11.9% in 6th grade, 4.5% in 7th grade and 6.6% in 8th grade acquisitions. At this point, although teamwork takes place very little in the acquisitions at all levels, it is determined that it is mostly in 3rd grade and 6th grade. When all acquisitions are considered regardless of the class level, it was determined that 45.0% analytical thinking, 44.7% decision making, 15.2% communication, 13.9% creative thinking, 10.6% entrepreneurship and 7.6% teamwork skills. In this context, it was understood that while analytical thinking and decision-making skills were the most involved in the acquisitions in the science program, entrepreneurship and teamwork skills were the least. In general, it was determined that life skills were mostly included in the 5th grade (169.4%) and 6th grade (144.1%) acquisitions in the science teaching program. Although other grade levels are close to each other, the rate of including life skills in acquisitions is 128.8% in 8th grade, 127.9% in 4th grade, 125.0% in 3rd grade and 123.9% in 7th grade, respectively. In addition, it was determined that life skills were included in the acquisitions for a total of 414 times in the program with a total of 302 acquisitions.

The placement levels of life skills in the acquisitions included in the secondary school science course-teaching program according to the grade levels are as given in Figure 1.



* Each percentage was calculated over the total gain at that grade level.

Figure 1. The Placement Level of Life Skills in Science Course Teaching Program Acquisitions According to Class Levels

When Figure 1 is analyzed, it was determined that there were 38.9% decision making, 33.3% analytical thinking, 16.7% communication, 13.9% entrepreneurship or teamwork, 8.3% creative thinking in the third-grade science lesson acquisitions. In this context, it has been understood that the acquisitions in the science program of the 3rd grade have the most decision-making and analytical thinking skills and the least creative thinking skills. When the 4th grade science course acquisitions are considered, it was understood that there were 44.2%

decision making or analytical thinking, 20.9% communication, 9.3% creative thinking, 6.9% entrepreneurship and 2.3% teamwork. At this point, it can be said that 4th grade acquisitions include the most decision making and analytical thinking, and the least teamwork. In the context of fifth grade, acquisitions were included 58.3% analytical thinking, 50.0% decision making, 27.7% creative thinking, 16.7% communication, 8.3% entrepreneurship and teamwork skills. As can be understood, while analytical thinking skills were placed the most at this class level, entrepreneurship and teamwork skills were the least. When sixth grade science acquisitions are examined, it can be said that there were 52.5% analytical thinking, 49.2% decision making, 11.9% creative thinking, communication or teamwork, 6.8% entrepreneurship skills. In the context of the seventh grade, acquisitions are included 40.3% decision-making, 38.8% analytical thinking, 13.4% creative thinking, entrepreneurship or communication skills, 4.5% teamwork skills. Finally, when we examine the acquisitions in the eighth grade, it was found that it included 45.9% decision making, 44.3% analytical thinking, 14.8% creative thinking or communication, 13.1% entrepreneurship and 6.6% teamwork. As can be understood, there is a similar situation at all grade levels, and it can be said that the acquisitions of the science teaching program mostly include analytical thinking or decision-making life skills. However, although the least skill varies according to grade levels, teamwork in 4th, 7th and 8th grade, creative thinking in 3rd grade, entrepreneurship in 6th grade, entrepreneurship and teamwork in 5th grade are the least emphasized skills in acquisitions.

Findings Regarding the Second Sub-Problem

The frequency-percentage values of the distribution levels of life skills emphasized in the acquisitions in the secondary school science course teaching program according to the subject area names (learning areas) are shown in Table 2. When the table was considered, in the acquisitions of the world and universe learning area; analytical thinking is at the maximum level in 6th grade, creative thinking is at the maximum level in 5th grade, and decision-making is at the maximum level in 6th grade. In acquisitions in the world and universe learning area, entrepreneurship is presented with only an acquisition in the 7th grade and teamwork is presented with only an acquisition in the 4th grade. However, communication skills are presented with one acquisition in 4th, 5th and 7th grades. In this context, it can be stated that in the world and universe learning area, there is little placement in entrepreneurship, teamwork and communication skills. In general, while there are 35 acquisitions in the world and universe learning area at all levels, it has been determined that six skills are involved 37 times in these acquisitions. In this context, it can be stated that skills are mentioned very little in the area of learning.

It has been determined that analytical thinking, creative thinking, decision making, entrepreneurship and communication skills in the living things and life learning area are at the 8th grade at most, and teamwork is at the 6th grade at most. It is understood that all life skills in almost all levels in this learning area are emphasized in at least one acquisition. In general, while there are 90 acquisitions in living things and life learning area at all levels, it has been determined that six skills are involved 118 times in these acquisitions. In this context, it can be stated that skills are given less space in the area of learning. In addition, although communication and teamwork do not take place at all levels, communication was determined at the 4th grade at most and teamwork at the 3rd grade level.

Table 2. Frequency-Percentage Values Regarding the Distribution Levels of Life Skills Emphasized in the Science Course Acquisitions according to Learning Areas

		Analytical thinking		Creative thinking		Decision making		Entrepreneurship		Communication		Teamwork		Total		NA
	Grade	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
World and Universe	3rd	2	5.7	-	-	2	5.7	-	-	-	-	-	-	4	11.4	5
	4th	-	-	-	-	-	-	-	-	1	2.9	1	2.9	2	5.7	5
	5th	3	8.6	3	8.6	3	8.6	-	-	1	2.9	-	-	10	28.6	7
	6tfh	4	11.4	2	5.7	4	11.4	-	-	-	-	-	-	10	28.6	5
	7th	3	8.6	1	2.9	3	8.6	1	2.9	1	2.9	-	-	9	257	10
	8th	1	2.9	-	-	1	2.9	-	-	-	-	-	-	2	5.7	3
	Total	13	37.1	6	17.1	13	37.1	1	2.9	3	8.6	1	2.9	37	105.7	35
Living Things and Life	3rd	3	3.3	2	2.2	3	3.3	3	3.3	2	2.2	1	1.1	14	15.6	11
	4th	3	3.3	-	-	3	3.3	1	1.1	3	3.3	-	-	10	11.1	8
	5th	5	5.6	2	2.2	5	5.6	1	1.1	3	3.3	2	2.2	18	20.0	9
	6tfh	7	7.8	1	1.1	7	7.8	2	2.2	4	4.4	4	4.4	25	27.8	22
	7th	3	3.3	1	1.1	3	3.3	1	1.1	3	3.3	2	2.2	13	14.4	15
	8th	11	12.2	3	3.3	11	12.2	4	4.4	6	6.7	3	3.3	38	42.2	25
	Total	32	35.6	9	10.0	32	35.6	12	13.3	21	23.3	12	13.3	118	131.1	90
Physical Events	3rd	7	6.3	1	0.9	9	8.1	1	0.9	2	1.8	2	1.8	22	19.8	16
	4th	11	9.9	4	3.6	11	9.9	2	1.8	4	3.6	-	-	32	28.8	20
	5th	9	8.1	5	4.6	6	5.5	2	1.8	-	-	-	-	22	19.8	14
	6tfh	11	9.9	3	2.7	9	8.1	1	0.9	-	-	-	-	24	21.6	19
	7th	12	10.8	4	3.6	13	11.7	3	2.7	2	1.8	1	0.9	35	31.5	26
	8th	7	6.3	4	3.6	7	6.3	3	2.7	2	1.8	1	0.9	24	21.6	16
	Total	57	51.4	21	18.9	55	49.6	12	10.8	10	9.0	4	3.6	159	143.2	111
Matter and its Nature	3rd	-	-	-	-	-	-	1	1.5	2	3.0	2	3.0	5	7.6	4
	4th	5	7.6	-	-	5	7.6	-	-	1	1.5	-	-	11	16.7	10
	5th	4	6.1	-	-	4	6.1	-	-	2	3.0	1	1.5	11	16.7	6
	6tfh	9	13.6	1	1.5	9	13.6	1	1.5	3	4.6	3	4.6	26	39.4	13
	7th	8	12.1	3	4.6	8	12.1	4	6.1	3	4.6	-	-	26	39.4	16
	8th	8	12.1	2	3.0	9	13.6	1	1.5	1	1.5	-	-	21	31.8	17
	Total	34	51.5	6	9.1	35	53.0	7	10.6	12	18.2	6	9.1	100	151.5	66

* Each percentage was calculated over the total number of acquisitions in learning areas of science course teaching program.

** NA: Number of Acquisitions

When we look at the physical events learning area; analytical thinking is in the 7th grade at most, creative thinking in the 5th grade at most, decision making in the 7th grade at most and entrepreneurship in the 7th or 8th grades at most. In addition, although communication and teamwork do not take place at all levels, communication was determined at the 4th grade at most and teamwork at the 3rd grade level. In general, while there are 111 acquisitions in the physical events learning area at all levels, it has been determined that six skills are included in these acquisitions a total of 159 times. When we look at the matter and its nature learning area;

analytical thinking and decision making are at most 6th graders, communication is found in 6th and 7th grades at most. Although creative thinking, entrepreneurship and teamwork do not take place at all levels, it has been determined that creative thinking and entrepreneurship are included in the 7th grade at most and teamwork at the 6th grade level at most.

In general, while there are 66 acquisitions in the matter and its nature learning area at all levels, it has been determined that six skills are emphasized 100 times in these acquisitions. As can be understood, it can be stated that analytical thinking and decision-making skills are the most common in all learning areas. It can be said that the least emphasized skill in the science teaching program differs according to the learning area. Entrepreneurship and teamwork in the world and universe learning area, creative thinking in the living things and life learning area, teamwork in the physical events learning area, creative thinking and teamwork in the matter and its nature learning area were identified as the least involved skills. In addition, when the rate of all skills is considered according to the total number of acquisitions in the program; it was determined that the skills were mostly in the material and its nature area, followed by physical events, living things and life, and least in the world and universe learning are.

Discussion and Conclusions

When the findings about the levels of life skills in the acquisitions of the secondary school science course teaching program, although analytical thinking skill is included in all levels, it is understood that it is included in 5th grade at most, then in 6th grade, 8th grade, 4th grade and at least in 3rd and 7th grade. Decision-making was found in almost half of the acquisitions at all grade levels, but it was found that it was in 4th and 5th grades at most and at least in 3rd grade. In this context, it can be said that analytical thinking and decision-making skills are the most involved in the acquisitions of the science program. Similarly, Deveci et al. (2018) stated in their studies that the acquisitions aimed at improving communication, decision-making and analytical thinking skills were mostly included according to the class levels. When the science lesson-teaching program is examined, it is thought that this skill is emphasized more in the acquisitions, since it often includes behaviors such as experimenting, making inference, modeling, and discussing, and analytical thinking skills are required in these processes.

Similarly, decision-making skills can be said that it is included in the science program more since it is used in situations such as decision-making skills are also used in the project development process, in the exploration phase, in drawing conclusions by establishing a relationship, in the process of making a new design, in researching and presenting etc. Because the science program is more open to developing and implementing activities, experiments or projects depending on the course content. In this context, it can be said that analytical thinking and decision-making skills are frequently used in acquisitions related to these. In addition, as Unnanantn and Boonphadung (2013) stated, analytical thinking is the decision-making process that includes reasoning ability and reflective thinking. In this context, it is expected that these two skills are parallel to each other.

According to the findings obtained from the study, it can be said that creative thinking skill is included in 5th grade at most, then in 8th grade and 7th grade, and at least in 3rd and 4th grade. When it is considered in general, it can be stated that although creative thinking is less involved in the acquisitions, especially in lower-level classes, it does not take place much at all grade levels. In the literature, Zorluoğlu, Kızılaslan, and Sözbilir (2016) stated that they did not detect an acquisition for the creation step in their study, where they analyzed the chemistry course teaching program acquisitions according to Bloom Taxonomy. Temizkan (2014) stated in his study that creative thinking is insufficient in Turkish textbooks. As can be understood, as a result of both our work and the studies in the literature, it can be stated that the creative thinking skill is not very much included in the programs.

It is expected that creative thinking skill is among the high-level skills and that it is less included in parallel with not being suitable for every subject. In parallel with this, it can be said that expressions about creative thinking skill are rarely encountered in the acquisitions examined within the scope of our study. It is thought that the science-teaching program should be suitable for the acquisitions in terms of producing new ideas and products, and in parallel with the STEM approach it adopts, creative thinking should be given more place. Because creative thinking; considering its importance in producing original products and presenting new ideas expected from the 21st century individuals of the future, it becomes clear what an important skill it is. In our study, it was determined that creative thinking was less included in the acquisitions in the specific lower classes. However, since the creative thinking of students should be supported in every period, also in the lower age groups, it is thought that the acquisitions aimed at developing creative thinking skills should be included in these levels.

As a result of the study, it was understood that the entrepreneurship skill in the science teaching program is included in the 3rd, 7th and 8th grade at least and at least in the 6th and 4th grade acquisitions. However, when it is considered in generally, it is determined that the percentage of placement is not very high. Güven (2010) stated in his study that the acquisitions of the life studies lesson-teaching program are more specific than the aims of the previous years in terms of gaining entrepreneurship characteristics to students, but they are not sufficient. It is known that in recent years, teaching processes that support the entrepreneurial characteristics of students have started to be included in education programs at an early age (Deveci & Aydın, 2017). However, it is also supported by this study that it is not enough to start giving this place. In parallel with being a skill that is included in the science-teaching program and has become increasingly important in recent years, entrepreneurship is expected to take place more in program acquisitions. In this context, this result can be expressed as an unexpected result within the scope of the study. Yurtseven and Ergün (2018a) stated in their studies that subjects such as “project development, designing new and original products, entrepreneurship, entrepreneurs, characteristics of entrepreneurs, innovation, and difference” should be taught about entrepreneurship. In this context, it is thought that the acquisitions towards entrepreneurship skills can be increased with this and similar content/expressions in the program.

According to the findings obtained from the study, although communication skills are less and close to each other at all grade levels, it is found that they are mostly in the 4th grade. Temizkan (2014) stated in the study that communicating in the Turkish course-teaching program is not sufficient to support students' effective

communication skills. In fact, today, it is more important to gain communication skills in a period when students (parallel to being generation z individuals) are more individual and connected to technology (Kaçar, 2019). It is thought that the acquisitions to improve communication skills should be included more in the science-teaching program. In fact, students are required to use their communication skills in many acquisitions that make the student active (such as presentation, discussion, project development, and forecasting). In this context, considering that the science program is a teaching program based on the constructivist approach, it is expected that the achievements in which students are active will be more. However, as Arsal (2012) stated as a result of his research, the acquisitions of the science teaching program are generally not structured in accordance with the principles of constructivist understanding. In this context, although some of the acquisitions in the program are suitable for the constructivist approach, it can be said that some of them are for a more cognitive level. It is thought that making arrangements regarding this situation will be appropriate in terms of improving life skills.

Teamwork, which is among the life skills in the science-teaching program, has been found to be in 3rd grade and 6th grade at most and at least in 4th grade, although it takes a very little place in acquisitions at all levels. Temizkan (2014) states in the study that decision-making in Turkish textbooks cannot be determined in accordance with any sub-skill. Yıldız Feyzioğlu and Tatar (2012) stated in their study that science books are limited in terms of creating learning environments based on group work. Teamwork is thought to be similar to communication skills. In fact, although the science course is a very suitable course for group and teamwork with the activities, projects and experiments that it contains, it can turn into an individual when not used. It is thought that parallel to the fact that the group being educated is z generation individuals, it should be directed towards teamwork and the acquisitions should be organized in this way. Because, as Kaçar (2019) stated, the negative aspects of generation z (2000 and later years) individuals are that they are individuals who like to live alone and prefer socializing via the internet. In order to eliminate these negative situations, it can be said that it is important to direct students to teamwork more.

When the findings regarding the level of life skills in the acquisitions of the secondary school science course-teaching program is examined, there is a similar situation at all grade levels, and it is understood that the science acquisitions mostly include analytical thinking or decision-making life skills. Similarly, Deveci et al. (2018) stated that in terms of grade levels, the acquisitions aimed at improving students' analytical thinking and decision-making skills were included at all grade levels. Although the least emphasized skill in the acquisitions in our study differs according to grade levels, teamwork in 4th, 7th and 8th grade, creative thinking in 3rd grade, entrepreneurship in 6th grade, entrepreneurship, and teamwork in 5th grade. Deveci et al. (2018) stated in their study that the number of acquisitions to improve students' teamwork skills is low at all grade levels. In this context, these results of the study are similar to the literature.

In addition, in our study, it was understood that life skills were included in the 5th grade and 6th grade at the most in the science-teaching program. Although the other grade levels are close to each other, they are as 8th grade, 4th grade, 3rd grade and 7th grade respectively. At this point, it can be said that the acquisitions regarding life skills are at least 7th grade. Deveci et al. (2018) in their study, it was determined that this situation differs. The researchers stated in their studies that they encountered acquisitions aimed at improving life skills at the

seventh grade the most and the third grade at the least. At this point, the importance of increasing and comparing similar studies emerges.

As a result of the study, it was determined that life skills emphasized in the acquisitions in the secondary school science course teaching program, analytical thinking and decision-making skills were the most involved in all learning areas. It was understood that the least emphasized skill in the science teaching program acquisitions differs according to the learning area. It was concluded that entrepreneurship and teamwork in “world and universe” learning area, creative thinking in “living things and life” learning area, teamwork in “physical events” learning area, creative thinking and teamwork skills in “matter and its nature” learning area are the least common skills.

When “world and universe” learning area was considered, it is seen that it contains units related to the Solar system and our Earth. When the units are examined, although it is seen as more limited to doing activities, with the development of technology, there are many developments in this learning area and it is thought that activities can be carried out for many skills in researches to be made on them. When the “living things and life” learning area is considered, it includes units such as the structure of our body, living things and the environment. At this point, it is thought that the acquisitions related to this learning area include most of the life skills, as well as the acquisitions related to creative thinking skills, which are rarely included. It was determined that teamwork is the least emphasized skill in “physical events” learning area. The scope of this learning area includes units such as force, light, sound, electricity, pressure, and simple machines. Most of these units are both suitable for activities and suitable for designing projects in parallel to being subjects related to daily life. At this point, it is thought that there is a deficiency in this area. Although the included acquisitions cover activities, it is thought that this deficiency arises because it is not clear whether it will be individual or group.

The last area of learning, “matter and its nature” includes subjects related to matter such as matter, properties of matter, matter and heat. In parallel with the fact that the subjects in this learning area are at a more micro level, creative thinking and teamwork skills are thought to be less. When the existence rate of all skills according to the total number of acquisitions in the science program in our study is considered, it has been understood that the skills are mostly in “matter and its nature” learning area, followed by “physical events”, “living things and life”, and least in “world and universe” learning area. It can be stated that this result is an expected situation. Considering this result, it is thought that “matter and its nature”, “physical events” are intended to provide students with skills such as analytical thinking, decision-making, communication, creative thinking, since it contains subjects such as the events around us, which can be exemplified with the events around us, project studies can be done, etc. When the literature is considered, Deveci et al. (2018) stated in their studies that the acquisitions aimed at improving life skills are mostly encountered in the learning areas of "physical events" and "living things and life" according to the learning areas. At this point, it can be said that there are some similarities and differences with the study in the literature.

In the results obtained from the study, it has been understood that analytic thinking and decision-making skills are the most involved in the acquisitions in the science-teaching program, regardless of class level and learning

area. It can be said that creative thinking, entrepreneurship and teamwork skills are least emphasized in the acquisitions of the program, although it varies according to class level and learning areas. Similarly, Deveci et al. (2018), in their study, determined that the acquisitions in the science program towards developing entrepreneurship, teamwork and creative thinking skills were less than other life skills. Although each life skill in the science-teaching program is important, it is thought that acquisitions related to creative thinking, entrepreneurship and teamwork skills should be included more. When the life skills in the science teaching program is generally considered in our study, it can be said that there is not much placement. Because there are a total of 302 acquisitions in the science teaching program, and six life skills are included a total of 414 times in the acquisitions. In other words, it can be considered as if there are 1 or 2 skills in each acquisition.

When the literature is considered, Yaz and Kurnaz (2017) stated in their study that in the vision of the science 2013 program, students were expected to have high-level cognitive skills, but the program included the acquisitions related to these skill levels to a limited extent. At this point, considering the obtained results of the study, it is thought that advanced life skills, which are important for raising today's competent people, are not emphasized too much in the prepared teaching program. Moreover, considering the vision of our teaching program and the teaching approaches it adopts, it can be stated that a suitable ground has been prepared for students to acquire skills such as entrepreneurship, communication and teamwork. Besides, when it is considered that the generation z students, who are tried to be teach through the science program, have characteristics such as creative and creative activities, result-oriented, risk-taking, entrepreneurial, having more than one ability and being open to communication (Kaçar, 2019), it is revealed that how the life skills are suitable for their characteristics.

Recommendations

As a result of the study, it was determined that the acquisitions in the science program included analytical thinking and decision-making skills the most, creative thinking, entrepreneurship and teamwork skills the least. It can be suggested to prepare sample activities for teaching these acquisitions, reconsidering and writing the acquisitions for these skills since the acquisition of the skills in the program is very important both for the education and life of the students because including skills in the acquisitions in the program is also very important for teachers to apply them. Karademir, Sarıkahya, and Altunsoy (2017) stated in their study that science teachers do not have sufficient knowledge about the concept of skill. At this point, if these skills are not included in the acquisitions and the program, it is not possible for teachers to do studies/activities related to them. In this regard, Özata Yücel and Kanyılmaz (2018) stated that some of the science teachers found the life skills in the science program sufficient, while others stated that the program was lacking in terms of activities and materials to gain these skills. At this point, the importance of activities to be created for these skills emerges.

In the study, it was concluded that the number of acquisitions for creativity and entrepreneurship skills in the acquisitions in the science-teaching program was low. In fact, since the science teaching is aimed to be based on engineering applications and entrepreneurship, it is thought that these skills should be included more. However,

it is understood that communication and teamwork skills in many levels and learning areas are less emphasized in science teaching program acquisitions. At this point, it can be suggested that these skills should be emphasized in acquisitions in order to improve the face-to-face communication and collaboration skills of individuals who grow up in the age of technology.

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