Southeast Asia Early Childhood Journal, Vol. 12 (2), 2023 (36-51)
eISSN 2821-3149
http://ejournal.upsi.edu.my/index.php/SAECJ

AN INVESTIGATION OF LUNA'S SCIENCE WORLD CARTOON ACCORDING TO SCIENCE COURSE OUTCOMES

Emine Akkaş Baysal[1], İjlal Ocak[2], Selin Evran[3]

[1]Child Development Department, Sandıklı School of Applied Sciences, Afyon Kocatepe University, Afyonkarahisar, Turkiye

[2]Science Education Department, Faculty of Education, Afyon Kocatepe University, Afyonkarahisar, Turkiye

[3]Teaches, Ministry of Education, Afyonkarahisar Turkiye

akkasemine85@hotmail.com[1], ijlalocak@gmail.com[2], selinevran25@gmail.com[3]

*Corresponding Author
Received: 09 January 2023; **Accepted:** 03 August 2023; **Published:** 08 August 2023

To cite this article (APA): Akkaş Baysal, E., Ocak, İjlal, & Evran, S. An investigation of luna's science world cartoon according to science course outcomes. *Southeast Asia Early Childhood Journal*, *12*(2), 36–51. https://doi.org/10.37134/saecj.vol12.2.3.2023

To link to this article: https://doi.org/10.37134/saecj.vol12.2.3.2023

ABSTRACT

This study aimed to reveal the relationship between the 3rd, 4th, 5th, 6th, 7th and 8th-grade science course outcomes and the first season of the cartoon "Luna's Science World". The document analysis method was used in the study, which was designed with a qualitative research model. The study group of research consisted of fifty cartoons in the first season of Luna's Science World. The content analysis method was used in the analysis of the data. As a result of the research, it was determined that except for three parts, all the topics covered in the cartoon were related to the science course outcomes. Additionally, it was seen that each of the episodes could be directly related to the outcomes of the Science course. This shows that almost all levels can benefit from the educational feature of this cartoon. From this point of view, as an educational cartoon "Luna's Science World" can be associated with related disciplines and used actively in learning environments, and their effects can be discussed.

Keywords: cartoon, luna, science world, science

INTRODUCTION

Many devices such as phones, tablets, computers and televisions have taken their place among the technological tools that are frequently used in daily life. However, the correct and controlled use of technological tools is essential. Technology, which is used beyond its purpose and excessively, does more harm than good to individuals. Individuals of all ages, especially children, spend long hours in front of the television. It is known that some television programs affect a child's development and growth (Rai et al., 2017).

It is thought that children mostly spend their time in front of the television and they usually prefer watching cartoons. In a research conducted in Turkey (Öktem et al., 2006), it is seen that television is in the first place in the media preferences of children, they watch television for an average of 3-4 hours a day, and they watch television approximately 900 hours

a year at kindergarden and 1500 hours at home (cited in Samur et al., 2014). Since cartoons appeal to the visual and auditory perception of the audience, the process turns into fun (Uçan, 2018). When asked two questions to the children "What do you enjoy watching most on TV?" and "Which programs do you watch?", it is seen that children directly answer "cartoons" (Cesur & Paker, 2007). Considering these programs, which cover almost all of the time they spend in front of the screen, from a comparative perspective, it is crucial to evaluate the effects of cartoons.

In this context, first of all, it is necessary to reveal what a cartoon is. Cartoons are programs formed from the animation of movements in line with a specific scenario with various drawing, photography or digital media techniques (Çalışkan, 2011). Cartoons animate hand-drawn pictures with animation methods (Köymen, 2008). In another definition, Alan (2009) says cartoons as filming a large number of separately made pictures and then showing them one after another on the screen to create an illusion of movement. The most crucial feature of cartoons is that although it has movement, it is an art with a unique field of creation that requires a scenario (Sevim, 2013).

When we look at the history of cartoons, it is seen that it is almost as old as the history of television. The first cartoon is the cartoon named "Humorous Phases of Funny Faces", made in America in 1906 by James Stuart Blackton on behalf of Vitagraph Co. It was then made by Walter Booth on behalf of Charles Urban Trading Co. in April in England the same year (Şenler, 2005). Cartoons for educational purposes first started with Thomas Edison in 1910. Edison argues that movies have an excellent teaching potential and will revolutionize the education system and replace books (Coşkun & Köroğlu, 2016). Many educators and cartoons have adopted this idea. In other words, movies have been accepted as a part of learning environments. At this point, Çelenk (1995) emphasizes that television is also a partner in the educational tasks of parents who undertake the task of educating the child at home.

Children's being in front of the television too much in the preschool period affects their school success and social relations (Özsevgeç & Saka, 2018). In a study conducted in New Orleans on this subject, it was determined that the first grade students who were in front of the television too much were less successful than those who spent less time in front of the television (Çilenti, 1980). Children can learn more information from the cartoons they watch according to their age. For example, In Finland, 6-year-old Mika Ranhunen was awarded a medal for saving her friend Tuukka Klaus, who fell into the river two years ago, by imitating what she saw in cartoons. Mika Jan Honen, who was four years old when she imitated what she saw from the cartoon, was declared a national hero as she was the youngest lifeguard in the country.

Besides being used for educational purposes, cartoons also save the educational process from boredom. It allows children to spend time with education in a more enjoyable way. Recently, with the development of technology, the effect of technological developments has been seen in the field of education, as it is seen in every field. Considering that the scientific and technological developments experienced today significantly impact our way of life, it has been argued that it would be beneficial for all individuals to be trained as science and technology.

Additionally, in the vision of the science and technology curriculum, it is emphasized that all students should be raised as science and technology literate (Ministry of National Education [MEB], 2006). The curriculun aims to raise individuals who can understand the articles, films and discussions in the written and visual media (Sürmeli, 2013). For this purpose,

learning environments where appropriate learning opportunities are offered to reveal and develop high-level learning skills such as creative thinking, analysis and evaluation, in which student-centred strategies are used, were also organized (Çepni & Çil, 2009). In this context, the constructivist learning approach has been advocated, in which students associate this information by using the ready-made information they have in their minds while learning the information; thus, they construct the new information they have learned in their minds, and in this process, the student is active and creates the relationships between the information acquired by the individual (MEB, 2006).

The rapid development of science and technology in the world and the becoming a race between countries has increased the importance of science education today. The innovations in the education system and curriculum for more effective science education have also shown their effect on science education curriculum. As a result of these changes, the concept of science literacy in science curriculum has come to the fore and started to increase its effect (Çepni, 2005). Many different methods and techniques within the constructivist approach and visual tools that increase permanence effectively eliminate deficiencies and negativities in science literacy (Evrekli et al., 2011). Visual media is effective in science education. Studies have also shown that teachers who benefit from informal sources such as written and visual media, television programs and movies can improve the learning quality of students, as well as from traditional sources (Shaw & Dybdahl, 2000). The rapid development of information technology in our age has led to the emergence of information societies. Societies need to follow new technological developments and arrange them according to themselves. Introducing new technologies plays an essential role in developing the students memorize science concepts.

The teaching purpose of the science course is to help them develop their thinking skills by teaching them how to learn and to raise them as researchers and inquisitive individuals (Lind, 2005). For this aim, compelling science and technology teaching should be carried out in schools. For example, the fact that there are too many scientific concepts in the science and technology course and these concepts are foreign to the students makes it difficult to teach science and technology. The most crucial task in facilitating this difficulty is the teacher. The teacher can present a good learning environment in the teaching process (Daşdemir, 2006).

In the science course, various learning resources are used to provide students with the outcomes in the curriculum. It is believed that teaching with more stimulants in science education will make learning more effective and permanent. They are audio-visual tools that effectively present abstract concepts to students. In the science curriculum, more emphasis was placed on visual learning-teaching tools. The use of tablet computers in science teaching has recently become widespread in primary schools to benefit from technology effectively (Hashemzadeh & Wilson, 2007). Many tablet computers were distributed to teachers and students within the Movement to Increase Opportunities and Improve Technology in Turkey (FATİH). In addition, materials such as videos, pictures, maps, sound recordings, and film recordings are all kinds of visual information elements. Students prefer movies more as a creative and exciting learning method (Weber & Silk, 2007). Films can fully portray soft information with all its relevant elements (Birkok, 2008).

One of the new technology products is animation-supported cartoons. Animation-supported cartoons should also take their place in the constructivist approach. The fact that there are a lot of abstract concepts in the science course in the second level of primary education and that the teaching in which animations are used in the teaching of these abstract concepts is

more successful than the traditional teaching shows the positive effect of animations on education (İnaç, 2010). Visual branches such as cartoons and animation easily attract the attention of children. It does not skip the task of educating children while entertaining them, as it contains it in its internal structure. Some studies have concluded that since cartoons improve children's imagination, they contribute to the increase in learning desire by transforming the teaching process into a more enjoyable process (Aşçı, 2006). In this context, this study is essential in determining how much science and technology-related subjects, especially subjects containing abstract concepts, affect students' academic achievement in the conceptual sense and also determining the level of student's attitudes and values in the learning environment.

In programs that primarily target children, the principle of *instructs while entertaining* is adopted (Özsevgeç & Saka, 2018). Learning environments enriched with materials are considered necessary as they lead children to think, question, research, use information, create their knowledge, dream and be creative for learning to be meaningful and permanent (Oruç & Teymuroğlu, 2016). Including science and research in cartoons expands children's imagination and increases their curiosity and interest in science. In this context, it is essential to include scientific content related to the subject in appropriate scenes in cartoons so scientific concepts and understandings can begin to take shape early (Bayır & Günşen, 2017). During the preschool period, children take their family members as an example and spend all their time with their families, and they spend most of their lives with their teachers at school together with the school period.

For this reason, teachers can make their lessons more enjoyable and instructive by keeping up with the time and developing technology, increasing the interest in their lessons with in-class and extra-class materials that will attract the attention of children-learning environments and lessons where children can have fun. At the same time, learning can be supported by cartoons. Students see their parents and teachers as models and care about their ideas and thoughts. In this respect, it is essential for the teachers to be conscious and guiding and in contact with the family so that the students are directed to watch educational cartoons both inside and outside the school and make the right choices. Although cartoons have gained such a place in children's daily lives and learning, there are not many studies in the literature on the use of cartoons in education (Berber et al., 2019).

Cartoons concretely show many abstract situations such as the representation of nuclear action in an atom, the nervous system, the internal structure of the ear, the inexplicable abstract concepts such as tolerance and freedom, which can be used to introduce the internal functions of the body, and the application of good-evil thoughts. With this aspect, cartoons help to embody and express abstract concepts that are difficult to understand in a science lesson. The presence of an auditory and visual environment is by the vitality and openness principle of teaching. In this way, cartoons contribute to making learning more permanent and to the development of students' imaginations. When we think of cartoons as a means of information transfer, science subjects can be given to children permanently and concretely by focusing on cartoon studies and using the educational aspect of cartoons. In this context, this study it is aimed to reveal the contributions of the cartoon named "Luna's Science World", especially in the process of gaining science literacy skills for children. For this purpose, it is aimed to evaluate the parts of the cartoon by the researchers.

METHODOLOGY

Model of the Research

In this study, which is qualitative research, document analysis was used. Document analysis is a data collection method that includes the analysis of written materials containing information about the phenomenon or events that are aimed to be investigated (Yıldırım & Şimşek, 2009). Document analysis consists of five stages: accessing documents, checking the originality of documents, understanding documents, analyzing, and using data (Foster, 1995). Document analysis includes the analysis of the facts and written materials related to the facts that are the subject of the research, including visual materials such as films, videos or photographs, and written sources when necessary. In this direction, the documents to be examined before the research was determined. The study examined, the cartoon, Luna's Science World, which consists of 50 parts, by considering primary and secondary school science lesson outcomes. The Brazilian animation Luna's Science World is a cartoon that young children watch with interest. In the cartoon, a curious 12-year-old girl constantly asks questions and then tells her family what she learns with a dance show in the garden of her house.

Analysis of Data

During the data analysis process, the researchers watched 50 episodes of Luna's Science World cartoon and the minutes related to the outcomes were converted into text. Content analysis was used in the research. Content analysis is a systematic, repeatable technique in which some words of a text are summarized with smaller content categories with coding based on specific rules (Büyüköztürk et al., 2013). It aims to reach the concepts and relationships that explain the data. The primary purpose of the fixed comparison analysis is to reveal the themes in the data set, compare the themes, code them, convert them into categories, and create a criterion.

RESULTS

Within the scope of the study, the first season (50 episodes) of Luna's Science World, which is broadcast on the MinikaGo channel, is examined. The cartoon is broadcast three times a day, at eleven in the morning, then at 16.30 and 00.30. The characters of the Brazilian cartoon are a 12-year-old girl named Luna, her brother named Jupiter and a weasel named Bızdık. The findings obtained as a result of the examination of the cartoon are presented in terms of the outcomes of the science course. The 50 parts of the cartoon match the scientific achievements of 3,4,5,6,7, and 8th grades. In addition, the findings are supported by direct quotations from the cartoon "Luna's Science World".

Table 1.

Episodes of Luna's Science World Cartoon

The Number of Episodes	The Name of the Episode	The Number of Episodes	The Name of the Episode
1st Episode	Where does honey come from?	26th Episode	Why do grapes sink?
2nd Episode	The mixture of yellow and blue	27th Episode	Round bubbles
3rd Episode	Giant ices	28th Episode	Pictures in the sky
4th Episode	Let us shine little star	29th Episode	Cat’s whiskers
5th Episode	The Rings of Saturn	30th Episode	Air balloon
6th Episode	Black cabbage leaves	31st Episode	Why is the sea salty?
7th Episode	The Smell of Earth	32nd Episode	Craters on the Moon
8th Episode	How does water turn into the rain?	33rd Episode	Do re mi flüte
9th Episode	Luna's Adventure to the Moon	34th Episode	Keller glue
10th Episode	Mirror mirror tell me	35th Episode	Snowflakes
11th Episode	The Eyes of Bızdık	36th Episode	Popcorns
12th Episode	Butterflies' feet	37th Episode	What are tails for?
13th Episode	First flight day	38th Episode	Flowers and fruits
14th Episode	Martians on Mars	39th Episode	Spider web
15th Episode	Do fish drink water?	40th Episode	Shall we count the thunder?
16th Episode	Ant power	41st Episode	Dog paws
17th Episode	Shooting stars	42nd Episode	Gorgeous star
18th Episode	Giant ices	43rd Episode	Camouflage
19th Episode	How does bread rise?	44th Episode	How old are you?
20th Episode	Luna's discovery of dinosaurs	45th Episode	Gorgeous chocolate forest
21st Episode	Everything falls to the ground	46th Episode	Silkworms
22nd Episode	Flying lights	47th Episode	Variable floors

23rd Episode	The Tale of the Snail	48th Episode	Shadows
24th Episode	Night sun	49th Episode	Echo echo echo
25th Episode	Let us reach for the rainbow	50th Episode	Rosary beetle

Associating Outcomes with Episodes and Examples

In the sections, there are the episodes of the cartoon and the outcomes of science curriculum. While linking the episodes and outcomes, some identifer used. Their meaning are as follows:

i. S stands for Science.
ii. The first number stands for grade.
iii. The second number stands for the unit of science curriculum.
iv. The third number stands for the subject or theme of science curriculum.
v. The fourth number stands for the outcome being in science curriculum.

Table 2.
The Episodes, Units, Themes and Outcomes of Science Curriculum

1st Episode "Where Does Honey Come From? "	S.4.2. Our Food / Living Things and Life S.4.2.1. Nutrients and Their Properties S.4.2.1.1. Explains the relationship between living life and nutrient contents.
3rd Episode "Giant Ices", 18th Episode "Giant Ices"	S.4.4. Properties of Matter / Matter and Nature S.4.4.4. Change of substance under the influence of Heat S.4.4.4.1. Designs experiments for the heating and cooling of the substance.
4th Episode "Let's Shine Little Star"	S.7.5. Interaction of Light with Matter/ Physical Events S.7.5.3. Refraction of Light and Lenses S.7.5.3.1. Observes the path of the light that changes the environment and associates the cause of the refraction with the change in the environment.
5th Episode "The Rings of Saturn"	S.6.1.Solar System And Eclipses/ Earth And The Universe S.6.1.1. Solar System S.6.1.1.1. Compares the planets in the solar system with each other. E. g.: "(08:31) Saturn: I am the sixth planet in the solar system. My name is Saturn. We are all the rings you see on my waist. You will be surprised when you find out. They are just dust. Rock and ice. All of them are beautiful. That is why you cannot walk in my rings, and you cannot skate."
6th Episode "Black Cabbage Leaves"	S.4.2.Our Food/ Living things and Life S.4.2.1. Nutrients And Properties S.4.2.1.2. It deduces water and minerals in all foods. E. g.: (07:35)Luna: "Hi dear kale leaves, I was wondering if I am the one keeping you a little bit? So olive oil?"

	Blacklists: "We are Kale Leaf. We Are Full of Water. We Lose Water As The Environment Gets Warmer. We Are Beautiful And Green. We Shrunk When We See Steam. We Are Full of Water. When We See Vapor, We Wept."
7th Episode "The Smell of Earth"	S.5.2. Living World/ Living things and Life S.5.2.1. Let's Get to Know the Living Things S.5.2.1.1. Classifies living things according to their similarities and differences by giving examples. E.g.: (05.54)Luna: that pleasant smell after the rain is here too. Jupiter: I can only smell radishes. Radishes: very regular radishes smell like radishes. Worm: We had better explain the real reason for the smell after the rain. There are various creatures under the ground here. They are so small that you cannot see them with your eyes alone. They are called microbes. They release the scent into the soil. This fragrance mixes with the air.
8th Episode "How Water Turns into Rain"	S.5.4. Matter and Change/ Matter and Its Nature S.5.4.1. Change of State of Matter S.5.4.1.1. He/she makes inferences based on the data obtained from the experiments he/she has done regarding that the substances can change state with the effect of Heat. E.g.: (07:11) Luna: first, we had water. Then we became water vapour and went up. Then we became clouds. We are trying to figure out how water turns into rain. Bulut: So let us tell you everything we know. The sun: I evaporate the water, but you cannot see it. Water vapour: you cannot see us, but when it evaporates, we form rain. Water droplets evaporate. Before the stormy shower, we become a cloud.
9th Episode "Luna's Adventure to the Moon"	S.5.1. Sun, Earth and Moon/ Earth and Universe S.5.1.3. Moon's Movements and Phases S.5.1.3.2. Explains the relationship between the phases of the Moon and the movement of the Moon around the Earth. a. Indicates the difference between the main and intermediate phases of the Moon. E.g.: (05:28) Luna: How do you turn into a full moon, half Moon, crescent and then hide? Moon: We all need to go into orbit to understand my phases. Sometimes I'm big; sometimes I am small. Sometimes full, sometimes half. You will find it strange to know that I have not changed. It is not me that is changed, and it is your perspective. I orbit the Earth throughout the Moon. I am a white sphere. Every day the light from the sun illuminates me a little differently.
10th Episode "Mirror Mirror Tell Me"	S.5.4. Matter and Change/ Matter and Its Nature S.5.4.1. Change of State of Matter S.5.4.1.1. He/she makes inferences based on the data obtained from the experiments he/she has done regarding that the substances can change state with the effect of Heat.

11th Episode "The Eyes of Bızdık", 16th Episode 'Ant Power", 22nd Episode "Flying Lights", 23rd Episode "The Tale of the Snail", 29th Episode "Cat's Whiskers", 34th Episode "Keller Glue"	S.3.6. Journey to the World of Living Things / Creatures and Life S.3.6.1. Let's Get to Know the Entities Around Us (12th Episode, 07:45) Luna: Why are you all moving your feet? Did it itch? E.g.: Butterfly: Whenever I see a blackberry or black mulberry. I want to taste it with my feet. Look at my feet. These daisies are my favorite flower. Nevertheless, new flowers can grow because I step on them. I try with my feet; these flavours are my favourite. We are butterflies, and we taste with our feet.
37th Episode "What Are Tails For?", 39th Episode "Spider Web", 41st Episode "Dog Paws", 43rd Episode "Camouflage"	S.3.6. Journey to the World of Living Things / Creatures and Life S.3.6.1. Let us get to know the beings around us S.3.6.1.1. Classifies living and non-living things by using examples around him. b. Of the living species, only plants and animals are mentioned. E.g.: (37th Episode, 05:54): Luna: Uh, can you use your tail to grab onto branches? Jupiter: and to hang. (06:14) we are bored: Oh, my tail is like a parachute. (It was a squirrel.) Luna: The wind is cold, but my tail keeps me warm. (Luna has become a fox.)
38th Episode "Flowers And Fruits", 44th Episode "How Old Are You?", 45th Episode"The Magnificent Chocolate Forest"	S.3.6. Journey to the World of Living Things/Living and Life S.3.6.1. Let's Get to Know the Entities Around Us S.3.6.1.2 presents the results of observing a plant's life cycle. It is expected to monitor the development of a plant for a certain period and to record the observation results. E.g.: (45th Episode, 06:27): Luna: Did I understand correctly that cocoa beans need to be dried, fermented and roasted to become chocolate? Then what? Cocoa: then they go to the factory. Chocolate candies, chocolate and eggs become chocolate.
14th Epiosode "Martians on Mars"	S.6.1.Solar System And Eclipses/ Earth And The Universe S.6.1.1. Solar system S.6.1.1. Compares the planets in the solar system with each other. a) Basic properties of planets are mentioned.
17th Episode "Shooting Stars"	S.6.1. Solar System And Eclipses/ Earth And The Universe S.6.1.1. Solar system S.6.1.1. Compares the planets in the solar system with each other. d) Meteor, meteorite, and asteroid concepts are mentioned. E.g.: (07:35) Luna: meteor, a meteorite shooting star. Have you ever thought about what we are? We were asteroids; we became meteorites, now stars. We are like stars in the sky. Then we descend to Earth. We burn, and we shine. Some call us shooting stars. However, we are meteorites. As we fall, we light up the sky.

	Shooting star: as it falls from the sky to the Earth, we break into small pieces and become dust.
19th Episode "How Bread Rises"	S.5.2. Living World/ Living things and Life S.5.2.1. Let's Get to Know the Living Things S.5.2.1.1. Classifies living things according to their similarities and differences by giving examples. a) Living things; classified as plants, animals, fungi and microscopic living things.
20th Episode "Luna's Discovery of Dinosaurs"	S.5.6. Human and Environment/ Living Beings and Life S.5.6.1. Biodiversity S.5.6.1.1. Questions the importance of biodiversity for natural Life. It gives examples of plants and animals that are endangered or in danger of extinction in our country and the world.
21st Episode "Everything Falls to the Ground"	S.7.3. Force and Energy / Physical Events S.7.3.1. Mass and Weight Relationship S.7.3.1.1. He calls the gravitational force acting on the mass weight. E.g.: (07:25) Luna: we feel lighter here, but why? Moon: I think you are talking about low gravity in me. Luna: what is gravity? Is this why we feel light on the Moon? Moon: Yes. Gravity is what makes you feel heavy in the world. (08:30): Earth: here is one of the gravitational puzzlers. There is a moon on Earth. It attracts everything like a magnet. Invisible but called gravity.
24th Episode "Night Sun"	S.4.1. Earth's crust and movements of our world / Earth and the universe S.4.1.2. Movements of Our World S.4.1.2.2. Explain the events that occur due to the movements of our world. a. It refers to the rotation of the Earth. c. The formation of night and day is mentioned. E.g.: (06:52): Luna: If you are not hiding, why can't we see you from the world at night? Sun: I was also telling you that you revolve around me. Luna: I thought the sun was moving. Up and down. Earth: no, I am the one who is on the move. The sun never moves. We are the most mobile here. The world turns. The sun stops there, the world turns, and the night turns to morning. It turns the day into evening.
26th Episode "Why Do Grapes Sink?"	S.6.4. Matter And Heat/ Matter And Its Nature S.6.4.2. Intensity S.6.4.2.1. Defines density a. It is emphasized that density is a distinguishing feature of matter. Example:(06:54) Luna: sweet apple, why do grapes sink while we swim? Apple: size does not matter; it is small. It does not matter how heavy it is. Density matters. That is the secret here. If the

	water is dense, unfortunately, it can sink. If its density is less than water, they stay above water.
27th Episode "Round Bubbles."	S.6.4. Matter And Heat/ Matter And Its Nature S.6.4.1. Particulate Structure of Matter hollow structure
28th Episode "Pictures in the Sky"	S.7.1 Solar System And Beyond /Earth And The Universe S.7.1.2. Beyond the Solar System: Celestial Bodies S.7.1.2.2. Explain the concept of the star. b. The constellations, which are the naming of the star groups seen as seen from the world, are mentioned. E.g.: (06:30) Constellation: not many people know this, but the parts that make up the Constellation are not as close together as they appear on Earth. We are pretty far away. Luna: Oh, big bear. This is it. Stars: bears, scorpions and princesses of distant lands each. You can look at them and find your way. There are 88 constellations. If you see pictures in the sky, they are us.
30th Episode "Flying Balloon"	S.5.4. Matter and Change / Matter and Its Nature S.5.4.4. Heat affects substances S.5.4.4.1. Discusses the results of the experiments by conducting experiments on the expansion and contraction of substances with the effect of Heat.
32nd Episode "Craters on the Moon"	S.5.1. Sun, Earth and Moon / Earth and Universe S.5.1.2. Structure and Features of the Moon S.5.1.2.1. Explains the properties of the Moon. c. It gives information about the surface of the Moon. E.g.: (05:44) Luna: aren't you a hole? Are you a crater? Crater: pits caused by meteorites or asteroids are called craters. We are bored: does it rain on the Moon too? Luna: I do not know, but I do not think so. Crater: I hope the asteroid showers do not fall on me; I am big enough.
33rd Episode "Do, Re, Mi Flute"	S.6.4. Matter And Heat/ Matter And Its Nature S.6.4.1. Particulate Structure of Matter S.6.4.1.1. Items; It means that it has a granular, void and mobile structure. The concepts of movable structure and vibration, translation and rotation are mentioned.
35th Episode "Snowflakes"	S.4.4. Properties of Matter / Matter and Nature S.4.4.4. Change of Matter with the Effect of Heat S.4.4.4.1. Designs experiments for heating and cooling of matter.
36th Episode "Popcorn"	S.4.4. Properties of Matter / Matter and Nature S.4.4.4. Change of Matter with the Effect of Heat S.4.4.4.2. Designs experiments that show that matter can change state with the effect of Heat. Only melting, freezing, and evaporation are mentioned in the phase changes.

	E.g.: (06:40) Luna: so that is what it means. Because it is scalding, the water inside us turns into steam and causes our upper part to explode. Then we turn into popcorn.
40th Episode "Shall We Count the Thunder?"	S.6.5. Sound And Its Properties/ Physical Events S.6.5.3. Speed of Sound S.6.5.1. Compares the speed of sound in different environments. b. The speed of light and sound in air; compares lightning, lightning and thunder over events. E.g.: (06:24) We are bored: roaring and banging simultaneously. Stormcloud: people and animals must be in a safe place. Lightning can be very dangerous. Luna: storm cloud, we are very curious about one thing. I wonder why we hear the thunder long after the bottle has exploded. (The cloud flashes lightning from different distances. Nearby they see and hear simultaneously. In the distance, they see the lightning first and then hear the thunder.) Luna: lightning and thunder happen at the same time. Cloud: Light travels faster than sound. That is why you see lightning before you hear thunder.
42nd Episode "The Magnificent Star"	S.6.1. Solar System And Eclipses/ Earth And The Universe S.6.1.1. Solar system S.6.1.1.1. Compares the planets in the solar system with each other.
46th Episode "Silk Bugs", 50th Episode "Rosary Bugs"	S.5.2.1. Let's Get to Know the Living Things S.5.2.1.1. Classifies living things according to their similarities and differences by giving examples.
47th Episode "Floating Soils"	S.5.3. Measuring Force and Friction S.5.3.2. Frictional force S.5.3.2.2. Explores the effect of friction force on motion in various environments by experimenting. E.g.: (06:25) Car: Yes, it is on the carpet. I am returning to a fast race car on a hard floor, but I am no different from a shelled snail on the carpet. This is because of friction. (The car moves on different surfaces. Water reduces friction.) Luna: The uneven carpet increased the friction, and we slowed down.
48th Episode "Shadows"	S.5.5. Propagation of light/physical phenomena S.5.5.4. Umbra S.5.5.4.2. Discovers by experimenting with what variables affect the entire shadow.
49th Episode "echo - echo - echo."	S.3.5. Light and sounds / physical phenomena in our environment. S.3.5.4. The role of sound in hearing S.3.5.4.2 Explains the relationship between sound intensity and distance.

DISCUSSION AND IMPLICATIONS

Today, adults and children spend much time with television and other technologies. The priority areas of interest for children are cartoons. It is possible to benefit from cartoons in lessons by associating them with many acquisitions and concepts in the context of science course. Cartoons can contribute to a fun and practical science lesson. As a result of the research, it is determined that the cartoon "Luna's Science World" includes the outcomes of science curriculum. When the 50 episodes are correlated with the 3rd, 4th, 5th, 6th, 7th, and 8th-grade science course outcomes, it is seen that only three episodes are not related to the outcomes. These episodes are the 2nd episode "Mixing Yellow and Blue", the 25th episode "Let's Reach for The Rainbow", and the 31st episode "Why Are the Seas Salty?". Apart from these three episodes, other episodes are associated with the outcomes and mostly the subjects related to the unit "Journey to the World of Living Things / Living Beings and Life" are mentioned.

Berber and his friends (2019), who conducted a study on the usability of cartoons in science courses, identified two sub-themes regarding education and cartoons. They are the usability of cartoons in education and the choice of cartoons in Science education. In that study, most teacher candidates think cartoons can be used in education. They state that the exciting and visual nature of cartoons can be used to increase students' interest in the course. Additionally, they say cartoons increase students' motivation in the courses. Kaya and Çengelci (2011) emphasize in their study with teachers candidates that movies help students develop their creative thinking, critical thinking and interpretation skills. Therefore, the choice of cartoons that are the subject of this study and the dissemination of their use in learning environments will contribute to acquiring these thinking skills.

In a study conducted by Korkmaz (2017), it is stated that teacher candidates should have specific characteristics to use cartoons as an educational tool in science courses. These features are determined as the theme of the elements to be considered in the selection of cartoons, and five sub-themes are given as "using correct information, being suitable for the course content, being realistic, interesting and entertaining". Teacher candidates state that their content should be examined first when choosing cartoons. In this study, it is concluded that the subjects in the cartoon Luna's Science World could be easily associated with the science course and, therefore, can set a good example.

Bayır and Günşen (2017) conclude in their study that cartoons are not sufficiently utilized as an opportunity for science education. They also state that scientific concepts in cartoons are limited to "telescope, solar energy, gases, mixtures, beaker, tube, acid, five sense organs, foods, microbes, living things, space, spaceship, planets, full moon, rocket". They say that cartoons are insufficient for children to meet some basic scientific concepts due to the low variety of scientific concepts in cartoons. It has been seen that these concepts are frequently used in the cartoon titled Luna's Science World, and it has been revealed that they overlap with the achievements of the science course.

CONCLUSION

Generally, at least one of the 3rd, 4th, 5th, 6th, 7th and 8th grade science course outcomes can be correlated with the episodes of the cartoon. The cartoon, which can be watched by preschoolers, but is suitable for primary and secondary school levels in terms of interpretation, encourages children to wonder and research. In addition, the character Luna, who is primarily

an experimenter in each episode, arouses children's curiosity about experimenting with the materials at home.

Although there are articles that contribute to the transfer of values in cartoons, it has been seen that the number of these articles is relatively low. Today, cartoons have started to have a much more important place in children's lives than before. From this point of view and considering the research findings, the following suggestions can be made. Increasing research on children and media will significantly contribute to the field and parents. It is necessary to show sensitivity in raising the awareness of teachers and school administration in schools and parents in the family and using films with appropriate content. Conducting applied studies for researchers will make an essential contribution to the field in eliminating the deficiencies in this subject.

REFERENCES

Alan, İ. (2009). *Sevgi içerikli çizgi filmlerin ilköğretim 5. sınıftaki çocukların görsel sanatlar dersinde yaptıkları resimler üzerindeki etkisinin incelenmesi [Investigation of the effect of cartoons with love on the pictures made by the 5th grade children in the visual arts class]*. [Unpublished master's thesis]. Gazi University, Ankara.

Aşçı, E. (2006). *Televizyondaki çizgi ve animasyon karakterlerin farklı yerleşim yerlerinde yaşayan çocukların tüketici davranışlarına etkisinin incelenmesi [Investigation of the effects of cartoon and animated characters on television on consumer behaviors of children living in different settlements]*. [Unpublished master's thesis]. Ankara University, Ankara.

Bayır, E., & Günşen, G. (2017). Okul öncesi dönem çocuklarının en çok izledikleri çizgi filmlerin bilimsel açılardan analizi [Scientific analysis of the cartoons most watched by preschool children]. *Trakya Üniversitesi Eğitim Fakültesi Dergisi [Journal of Trakya University Faculty of Education]*, *7*(2), 746-761. https://doi.org/10.24315/trkefd.303686

Berber, A., Anılan, B., Odabaş, İ. N., & Alkan, D. (2019). Fen bilimleri öğretmen adaylarının eğitimde çizgi filmin kullanımına ilişkin görüşleri [Science teacher candidates' views on the use of cartoons in education]. *Eskişehir Osmangazi Üniversitesi Sosyal Bilimler Dergisi [Eskişehir Osmangazi University Journal of Social Sciences], Özel sayı (20),* 1-12. https://doi.org/10.17494/ogusbd.548529

Birkok, M. C. (2008). Bir toplumsallaştırma aracı olarak eğitimde alternatif medya kullanımı: Sinema filmleri [The use of alternative media in education as a socialization tool: Cinema films]. *Uluslararası İnsan Bilimleri Dergisi [International Journal of Human Sciences]*, *5*(2), 1-12. https://doi.org/10.14687/ijhs.v5i2.574

Büyüköztürk, Ş., Çakmak, E.K, Akgün, Ö.E, Karadeniz, Ş., & Demirel, F. (2013). *Bilimsel araştırma yöntemleri [Scientific research methods]*. 14. Baskı. PEGEM Publishing, Ankara.

Cesur, S., & Paker, O. (2007). Televizyon ve çocuk: Çocukların TV programlarına ilişkin tercihleri [Television and the child: Children's preferences for TV programs]. *Elektronik Sosyal Bilimler Dergisi [Electronic Journal of Social Sciences]*, *6*(19), 106-125. Retrived from https://dergipark.org.tr/tr/pub/esosder/issue/6133/82244

Coşkun, E., & Köroğlu, M. (2016). Pepee ve Caillou çizgi filmlerinde kavram öğretimi [Concept teaching in Pepee and Caillou cartoons]. *Milli Eğitim Dergisi [Journal of National Education]*, 210, 601-619. Retrived from https://dergipark.org.tr/tr/pub/milliegitim/issue/36140/406050

Çalışkan, S. (2011). Canlandırma sanatında oyunculuk [Acting in the art of animation]. *Türk Sanatları Araştırmaları Dergisi [Journal of Turkish Arts Studies], 2*(1), 183-195. Retrived from https://silo.tips/download/canlandirma-sanatinda-oyunculuk-acting-in-animation-art

Çelenk, E. (1995). *TV'de gösterilen çizgi filmlerin ilkokul çağı çocukları üzerindeki etkileri[The effects of cartoons shown on TV on primary school children]*. [Unpublished master's thesis]. Ege Universtiy, İzmir.

Çilenti, K. (1980). *Çocuk ve kitle iletişim araçları, çocuk ve eğitim [Children and mass media, children and education]*. Ankara: Turkish Education Association Publications.

Çepni S. (2005). *Kuramdan uygulamaya fen ve teknoloji öğretimi [Science and technology teaching from theory to practice]*. Ankara: Pegem A Publishing.

Çepni S., & Çil E. (2009). *Fen ve teknoloji programı ilköğretim birinci ve ikinci kademe öğretmen el kitabı [Fen ve teknoloji programı ilköğretim birinci ve ikinci kademe öğretmen el kitabı].* Ankara: Pegem A Publishing.

Daşdemir, İ. (2006). *Fen bilgisi dersinde animasyon kullanınımının akademik başarı ve kalıcılığa etkisi [The effect of using animation in science lesson on academic achievement and retention]*. [Unpublished master's thesis]. Atatürk University, Erzurum.

Evrekli E., İnel D., & Balım A. (2011). Fen öğretiminde kavram karikatürleri ve zihin haritalarının birlikte kullanımının etkileri üzerine bir araştırma [A research on the effects of using concept cartoons and mind maps together in science teaching]. *Elektronik Fen ve Matematik Eğitimi Dergisi [Electronic Journal of Science and Mathematics Education]*, 5(2), 58-75. Retrived from https://dergipark.org.tr/tr/pub/balikesirnef/issue/3373/46553

Foster-Harrison, E. S. (1995). Peer helping in the ele- mentary and middle grades: A developmental perspective. *Elementary School Guidance & Counseling, 30* (2), 94-105. Retrived from https://eric.ed.gov/?id=EJ515685

Hashemzadeh, N., & Wilson, L. (2007). Teaching with the lights out: what do we know about the impact of technology-intensive instruction? *College Student Journal*, 41(3), 601-612. Retrived from https://eric.ed.gov/?id=EJ777961

İnaç, A. (2010). *Animasyon Kullanımının İlköğretim Öğrencilerinin Fen ve Teknoloji Dersindeki Akademik Başarılarına ve Akılda Tutuma Düzeylerine Etkisi: 6. 7. ve 8. Sınıflar Örneği [The Effect of Using Animation on Academic Achievement and Retention Levels of Primary School Students in Science and Technology Lesson: Example of 6th, 7th and 8th Grades]*. [Unpublished master's thesis]. 18 Mart University, Çanakkale.

Kaya, E., & Çengelci, T. (2011). Öğretmen adaylarının sosyal bilgiler eğitiminde filmlerden yararlanılmasına ilişkin görüşleri [Opinions of pre-service teachers on the use of films in social studies education]. *Journal of Social Studies Education Research, 2*(1), 116-135.

Korkmaz, M. (2017). Din dersi öğretmenlerinin bir öğretim materyali olarak filmleri kullanma durumları [Situations of religion lesson teachers' use of movies as a teaching material]. *Bilimname, 33*(1), 35-66. https://doi.org/10.28949/bilimname.345561

Köymen, E. (2008). *Üç boyutlu animasyon filmlerde mimarlık [Architecture in 3D animated films]*. [Unpublished master's thesis]. Trakya University, Edirne.

Lind, K. K. (2005). *Exploring Science in early childhood. A Development Approach.* Thomson Delmar Learning, USA.

MEB. (2006). *İlköğretim fen ve teknoloji dersi öğretim programı [Elementary science and technology course curriculum]*. Ankara: MEB.

Oruç, Ş., & Teymuroğlu, B. (2016). Sosyal bilgiler öğretiminde çizgi film kullanımının öğ-rencilerin akademik başarılarına etkisi [The effect of using cartoons in social studies teaching on students' academic achievement]. *Uluslararası Alan Eğitimi Dergisi [International Journal of Field Education]*, *2*(2), 92-106. Retrived from https://dergipark.org.tr/tr/pub/ijofe/issue/28468/303428

Özsevgeç, C., & Saka, A. (2018). Çocukların izledikleri çizgi filmler ve bu tercihlerinin karakterleri ile ilişkisi [The cartoons that children watch and the relationship of these choices with their characters]. *Uluslararası Bilimsel Araştırmalar Dergisi [International Journal of Scientific Research]*, *3*(2), 725-734. https://doi.org/10.21733/ibad.452142

Rai, S., Waskel, B., Sakalle, S., Dixit, S., & Mahore, R. (2017). Effects of cartoon programs on behavioural, habitual and communicative changes in children. *International Journal of Community Medicine and Public Health, 3*(6), 1375-1378. Retrived from https://www.ijcmph.com/index.php/ijcmph/article/view/397

Samur, A. Ö., Demirhan, T. D., Soydan, S., & Önkol, L. (2014). Pepee çizgi filminin ebe-veyn öğretmen ve çocuk gözüyle değerlendirilmesi [Assesment of pepee cartoon from perspectives of parents teachers and children]. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi [Journal of Mustafa Kemal University Institute of Social Sciences], 11*(26), 151-166. Retrived from https://dergipark.org.tr/tr/pub/mkusbed/issue/19572/208633

Sevim, Z. (2013). *Çizgi filmlerin değerler eğitimi bakımından karşılaştırılması [Comparison of cartoons in terms of values education]*. [Unpublished master's thesis]. Uşak University, Uşak.

Sürmeli, H. (2013). Fen ve matematik eğitiminde teknolojik pedagojik alan bilgisi temelli öğretim tasarımları [Technological pedagogical content knowledge-based instructional designs in science and mathematics education]. In T. Y. Yelken, H. S. Tokmak, S. Özgelen & L. İncikabı. (Ed.), *Bilim kurgu filmlerinin desteği ile TPAB temelli-fen teknoloji toplum dersi tasarımı [TPACK-based science technology society lesson design with the support of science fiction movies]* (pp. 149-164). Ankara: Anı Publishing.

Shaw, D. G., & Dybdahl, C. S. (2000). Science and the popular media. *Science Activities: Classroom Projects and Curriculum Ideas, 37*(2), 22-31. https://doi.org/10.1080/00368120009603564

Şenler, F. (2005). Animasyon tarihi, teknikleri ve Türkiye'deki yansımaları [Animation history, techniques and reflections in Turkey]. *Hacettepe Üniversitesi Türkiyat Araştırmaları [Hacettepe University Turkic Studies Studies], 3,* 99-114. Retrived from https://dergipark.org.tr/tr/pub/turkiyat/issue/16673/330713

Uçan, B. (2018). Türk çizgi filmlerinde kültürel kodlamalar [Cultural coding in Turkish cartoons]. *Journal of International Social Research, 11*(55), 1134-1144. DOI: 10.17719/jisr.20185537283

Uşun, S. (2003). Eğitim ve öğretimde bilgisayarın yararları ve bilgisayardan yararlanmada önemli rol oynayan etkenlere ilişkin öğrenci görüşleri [Students' views on the benefits of computers in education and education and factors playing an ımportant role in using computers]. *Kastomunu Eğitim Dergisi [Kastamonu Journal of Education], 2*(11), 367-378. Retrived from https://search.trdizin.gov.tr/tr/yayin/detay/81180/

Weber, C. M., & Silk, H. (2007). Movies and medicine: An elective using film to reflect on the patient, family, and illness. *Family Medicine, 39*(5), 317-319. Retrived from https://pubmed.ncbi.nlm.nih.gov/17476603/

Yıldırım, A., & Şimşek, H. (2009). *Sosyal bilimlerde nitel araştırma yöntemleri [Qualitative research methods in the social sciences]*. Seçkin Publishing, Ankara.