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Examining the 5th grade science textbook learning units in the context of values: Türkiye century education model

Hatice Belge Can *, Hümeyra Ceylan Soylu

Burdur Mehmet Akif Ersoy University, TÜRKIYE

***Corresponding Author:** hbelgecan@mehmetakif.edu.tr

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ABSTRACT

The purpose of this study is to examine the learning units in the 5th grade secondary school science textbooks prepared within the framework of the Türkiye Century Education Model in the context of values. In this study, in which document analysis, one of the qualitative research designs, was used, the 5th grade science textbook published by the Ministry of National Education to be taught in secondary schools in the 2024–2025 academic year was examined. The learning units in the relevant book (discovery, activity, design, Scholars', information) were analyzed within the framework of Schwartz (1996) values typology. According to the findings, there are a total of 67 values in the learning units in the 5th grade science textbooks. Among these values, "success" (f=17) and "self-direction" (f=17) are the most frequently occurring values, followed by "power" (f=10), "benevolence" (f=10), "universalism" (f=5), "conformity" (f=4), "stimulation" (f=2) and "security" (f=2), respectively. It was determined in this research that most of the Schwartz values are embedded in the 5th grade science textbooks prepared within the framework of TCEM except conformity and tradition values. By involving most Schwartz values inside, it can be implied that the 5th grade science textbooks prepared within the framework of TCEM provides insights for educators aiming to increase their value consciousness. In this regard, suggestions were made for educators aiming to foster more value-conscious approaches to science teaching.

Keywords: Türkiye Century Education Model; science textbook, Schwartz values typology

INTRODUCTION

Education is an important element that determines the development of societies and nations by supporting the personal success of individuals. In this respect, the national education provided in our country should have educational programs that meet today's needs and prepare individuals for the future. In this context, the Türkiye Century Education Model (TCEM) was adopted by the Ministry of National Education (MEB) and put into practice in the 2024-2025 academic year at pre-school, primary school 1, secondary school 5, secondary school preparatory and 9th grade levels (Ministry of National Education [MEB], 2024a).

TCEM is based on the principles of meeting the needs of the age, student-centeredness, sustainability and continuous improvement (Ülçay, 2024). This model, which has a flexible structure that can be revised according to changing situations and needs in the world, aims to support the multi-faceted development of students in terms of physical, social, mental, emotional and moral aspects (MEB, 2024b).

TCEM curriculum consists of five basic components. These are: basic approach, student profile, virtue-value-action framework, skills framework and holistic education approach. The "virtue-value-action framework", one of the inter-program components of TCEM, is an important part of learning-teaching practices (MEB, 2025a). In other words, values in TCEM are not disconnected from field-specific skills, on the contrary, they are integrated. The main goal of the model is to "reach from actions to values, from values to virtuous people, and from virtuous people to the ultimate goal of "Peaceful Family and Society" and "Peaceful People in a Livable Environment"" (MEB, 2025b, p. 36).

Although the inclusion of values in the curriculum dates to the 2010s, it has gained even more importance in the 2019 Science Course Curriculum. In this curriculum, justice, friendship, honesty, self-control, patience, respect, love, responsibility, patriotism and helpfulness are expressed as core values. In TCEM, values were presented with a framework for the first time. With this framework justice, responsibility and respect were adopted as the umbrella values. Other sub-values that should be interlocked with the umbrella values like puzzle pieces are framed in three areas: "human" (patience, thrift, diligence, modesty, privacy, healthy life), "family and social environment" (love, friendship, patriotism, helpfulness, honesty, family integrity, freedom) and "physical environment" (sensitivity, compassion, aesthetics, cleanliness) (MEB, 2025b).

The values that constitute the context of this research are based on the virtue-value-action framework included in TCEM and the 5th grade secondary school science textbooks. In science textbooks prepared with the motto "Knowledge in its origin, skill in its focus, future in its target!", "the understanding of science education that integrates scientific knowledge with universal morality, national and cultural values" is emphasized (MEB, 2025c, p.17). There are five learning units in the 5th grade science textbooks, which are prepared as 2 books to be taught in the fall and spring semesters. These learning units, which are referred to as "learning stations" in Turkish context, are: discovery, activity, design, Scholars' and information learning units.

Discovery learning units are the sections where the lives, discoveries, and inventions of scientists who have been unforgettable for centuries and who have shaped the world with their discoveries that have made our lives easier are briefly explained, as well as how those discoveries were achieved, and where remarkable scientific information is included. Activity learning units are the sections where activities related to learning outcomes are included, allowing students to learn by doing and experiencing various activities, inspire their environment, produce, share and actively participate. Design learning units is the section where students determine the construction stages, materials and designs of the models they will design on the subject, create original products and introduce and present these products to their friends. The Scholars' learning units is the section where the world-famous scientists who have made great discoveries in science and artwork in which fields and the discoveries, inventions and discoveries they have made are briefly explained. Information learning units are the sections where information about the historical development and features of inventions that make our lives easier, as well as the notable aspects of historical artifacts and some scientific projects are given (MEB, 2024c, p. 9-10).

There are many studies in the relevant literature examining science textbooks in the context of values (Demir & Özer, 2023; Özdemir, 2023; DeHart, 2022; Ünal & Benzer, 2024a, 2024b; Bakırcı & Biber, 2022; Yılmaz & Kıran, 2023; Yılmaz & Yıldırım, 2023). In these studies, science textbooks at various grade levels were examined on the 10 core value axes included in the 2019 science curriculum. No study has been found in which the 5th grade middle school science textbook, prepared within the framework of TCEM and used for the first time in the 2024-2025 academic year, is examined in the context of values. This study has the potential to guide the up-to-date literature by uncovering how these values are embedded or neglected. The study hopes to provide insights for educators aiming to foster more value-conscious approaches to science teaching.

In their study examining secondary school science textbooks in the context of values, Yılmaz and Kıran (2023) and Rasmitadila et al. (2020) conducted data analysis using a "values evaluation scale", while other studies exemplified above based their data analysis on the 10 core values included in the curriculum. Researchers using the Schwartz value typology have generally coded these values as individual orientations and examined the relationship between individuals categorized accordingly and some variables (Dilmaç, Bozgeyikli & Çıkılı, 2008; Filiz & Sel, 2018; Kahyaoğlu & Kırıktaş, 2015; Kalgı, İnan & Özen, 2020; Kuşdil & Kağıtçıbaşı, 2000; Reuter & Leuchter, 2022). While some researchers using the Schwartz value typology examined the values in fairy tales (Akkaya, 2014) and illustrated children's books (Körükçü, Kapıkıran and Aral, 2016; van der Graaf et al., 2018); some researchers examined the values in Turkish textbooks (Aytekin, 2015; Şakiroğlu, 2020). No study has been found that analyzes the values in science textbooks using the Schwartz value typology. This is considered to be another important contribution of this research to the literature.

In this context, this research examines the learning units in the 5th grade secondary school science textbooks prepared within the framework of TCEM in terms of values and seeks answers to the question "What are the Schwartz values in the learning units in the 5th grade middle school science textbooks prepared within the framework of TCEM?" and the following sub-research problems.

1. What are the Schwartz values included in the discovery learning units of the 5th grade secondary school science textbook prepared within the framework of TCEM?
2. What are the Schwartz values included in the activity learning units of the 5th grade secondary school science textbook prepared within the framework of TCEM?
3. What are the Schwartz values included in the design learning units of the 5th grade secondary school science textbook prepared within the framework of TCEM?
4. What are the Schwartz values included in the Scholars' learning units of the 5th grade secondary school science textbook prepared within the framework of TCEM?

What are the Schwartz values included in the information learning units of the 5th grade secondary school science textbook prepared within the framework of TCEM?

METHODS

Research design

In this study, document analysis, one of the qualitative research designs, was used. This design enables detailed analysis of written materials containing information about the facts, events and situations examined and the creation of a new integrity from the information obtained (Creswell, 2002; Çepni, 2007; Yıldırım & Şimşek, 2005). In this study, the document examined is a secondary school science 5th grade textbook, while the phenomenon examined is values.

Data analysis

In this study, content analysis, one of the qualitative data analysis methods, was used. This analysis technique allows the data to be examined in more detail by focusing on the origins of the phenomenon or event being investigated and the codes to be brought together and categorized within the framework of certain concepts and themes (Bengtsson, 2016; Crabtree & Miller, 1999; Merriam & Grenier, 2019; Yıldırım &Şimşek, 2005). In content analysis, coding can be done according to previously determined concepts, concepts extracted from the data, and the general framework of the research problem (Miles & Huberman, 1994). The data analysis of this study was done by considering the values in the Schwartz (1996) values typology as codes.

In this analysis process, the definition, purpose and sub-value contents of Schwartz (1996) values presented in Table 1 were used. The codes obtained (Schwartz values) were categorized and reported separately for each of the five learning units (There is no Scholars' learning units in the 3rd Unit of the books). For example, an expression emphasizing the need to "respect the ideas and decisions of others" has been associated with Schwartz's (1996) value of universalism because this requires being virtuous, understanding, and tolerant. The conclusion based on the results of content analysis were presented in a numerical and tabular form. The agreement between the two researchers was calculated as 91.8% using the reliability formula of Miles and Huberman (1994) [Reliability = Consensus / (Consensus + Disagreement)]. This shows that the results obtained are reliable.

Table 1. Schwartz values typology

Values	Description and purpose	Sub-Values
Power	Social position and prestige, control or authority over people and resources	To have social power, to have authority, to be rich, to be able to maintain appearance in society, [to be accepted by people]
Success	Personal achievement orientation based on social standards	To be successful, to be competent, to be ambitious, to be influential, [to be intelligent]
Conformity	Personal reward of pleasure and senses	Pleasure, enjoying life
Stimulation	Excitement, challenge of life and search for innovation	Being brave, living a varied life, having an exciting life
Self-direction	Preference for independent thought and action, exploration and investigation	Being creative, being curious, being free, being able to choose your own goals, being independent, [having self-respect]
Universalism	Being understanding, appreciative and tolerant, looking out for the good of people and nature	Being open-minded, being virtuous, social justice, equality, wanting a world in peace, a world full of beauty, being in unity with nature, protecting the environment, [inner harmony]

Benevolence	To look after, develop and protect the well-being of those with whom one has personal contact	Being helpful, being honest, being forgiving, being loyal, being responsible, [true friendship], [mature love], [a spiritual life], [a meaningful life]
Tradition	Accepting, adhering to and respecting some customs and ideas of religion or traditional culture	To be modest, to be religious, to accept what life gives you, to be respectful of traditions, to be moderate, [to refrain from worldly affairs]
Harmony	Limiting impulses and tendencies that are likely to violate social norms and expectations, disturb others, or cause injury	Being polite, being obedient, valuing parents and elders, being able to control oneself
Security	Security, peace and stability of society, relationships and the individual himself	National security, wanting social order to continue, being clean, family security, returning kindness, [sense of attachment], [being healthy]

Note. Values in square brackets are those that have not been found to yield consistent results in cross-cultural comparisons

Findings

In this study, the 5th grade middle school science textbooks prepared within the framework of TCEM and put into practice for the first time in the 2024-2025 academic year were examined in the context of Schwartz (1996) values typology. In this section, the findings regarding the five learning units in the 5th grade middle school science textbooks I and II prepared to be taught in the 1st and 2nd term are given.

Schwartz values in discovery learning units

Our neighbour in the sky: the sun

Galileo, using a telescope he developed centuries ago, projected sunspots onto paper. He observed the sunspots at certain intervals and noticed that they rotated in the same direction. Thus, he proved that the sun rotates counterclockwise around its axis (p.18).

From the above statement, it is understood that Galileo achieved the competence to discover the unknown by working with determination, devotion and determination and by associating these characteristics with his prior knowledge. According to Schwartz (1996) value typology, this situation can be associated with the sub-values of success value, being successful and being competent.

Our Earth and our neighbours in the sky

Uluğ Bey (Ulugh Beg) was a Turkish ruler interested in mathematics and astronomy. He conducted studies in the field of astronomy with the observatory he had built in Samarkand and built the observation device called the "Wall Dial", which was the largest observation device of its time. With the observations and calculations, he made in the observatory, he determined that a year was 365 days, 6 hours, 10 minutes and 8 seconds. This calculation, made in the 1400s, is approximately 1 minute shorter than today's modern measurement results. This situation is an indication of how far astronomy had come under the conditions of that time (p. 41).

The above statement describes Uluğ Bey's interest in astronomy and other related branches of science. This interest and curiosity encouraged Uluğ Bey to build the "Wall Dial", which has an important place in the history of science, in other words, to take action in the field he was interested in. This situation is related to Schwartz's (1996) self-direction value. Uluğ Bey's achievements beyond the conditions of his time (e.g., determining a year with a result of approximately 1 minute) prove that he was an authority and a pioneer in society thanks to his foresight in the field of astronomy. In this respect, the statements in question can also be related to Schwartz's (1996) values of power and success.

Force and measurement of force

Isaac Newton managed to attract attention by using the observations he made when he was a child. In those days, his biggest dream was to be first in the long jump race he played with his friends. He had to find a solution for the defeats he received. He observed the direction and strength of the wind for days. It was obvious from his demeanor that he was determined to use the data he collected. He invited his friends, who were unaware of anything, to a long jump race as usual. When the wind blew the strongest, he started the race himself. With the support of the wind behind him, he jumped the farthest. His friends, who had defeated him many times in this

field, were amazed. In the following years, he opened new eras in the world of science with his studies, especially about force. Due to his important contributions to science, the unit of force was given his surname (p. 56).

The above statements indicate that Newton adopted a scientific approach even in solving his daily problems and applied this approach with determination and perseverance until he achieved his goals. The unit of force, "Newton", is a result of Isaac Newton's great contributions to the scientific community by adhering to these methods. This result depends on Newton having a respected place among scientists and being seen as an authority in his field. In this respect, the statements in question can be associated with Schwartz's (1996) values of success and power.

Cell and organelles

In the 1590s, eyeglass manufacturers were the first to realize that lenses could be used in microscopes. Hans Janssen and his son Zacharias Janssen thought that with a single lens, the images of objects could be magnified slightly, and that with two lenses, they could magnify them even more. By placing the lenses in a tube, the father and son realized that the object they looked at through the tube appeared 10 times larger. Thus, the first known microscope in history was invented (p.98).

The above statements describe the discovery of the unknown by the Dutch optician Hans Janssen and his son Zacharias Janssen through their scientific, independent and questioning thinking. The fact that they determined their own goals and invented a groundbreaking product (microscope) in the history of science is related to the self-direction value of Schwartz (1996). The fact that they invented the microscope that helped us discover the micro world indicates their intelligence. This situation can also be related to the success value of Schwarz (1996).

Support and movement system

The greatest gift of İbn Sina, known as "Avicenna" in the West, to the history of science is his work entitled El Kanun Fi't-Tıbb, in which he compiled his research results. This work is the most important medical work of all time and was taught as a basic medical text in many universities in Europe until the 17th century (p.114).

These statements explain İbn Sina's important place in the history of medicine. İbn Sina's being a visible, accepted and respected person in society thanks to his world-famous work is related to Schwarz's (1996) power value. In addition, it is seen that he is an international authority with this work, which provides the basis of university education for medical students. This competence of İbn Sina can also be associated with Schwarz's (1996) success value.

Leonardo da Vinci

Leonardo da Vinci made comprehensive drawings on the proportions and anatomy of the human body. He drew pictures of all the bones in the body and showed the movements of the bones because of the muscular system. He talked about the curvature of the spine and the number of vertebrae and showed these with drawings (p.114).

The above statements describe Leonardo da Vinci as synthesizing his art with the science of anatomy. This famous painter's bold search for innovation is related to Schwarz's (1996) stimulation value. This innovation is also related to the self-direction value because it is understood from the statements that Leonardo da Vinci practiced his art by making free and independent choices according to his own purposes.

Schwartz values in activity learning units

Phases of the Moon

Create separate expert tables for each phase of the Moon in the classroom. Leave your group and go to the expert table related to the phase of the Moon on your badge. Make your presentation to other experts at the expert table and listen to their presentations actively and evaluate them. Remember that each student has the right to express their opinions and make decisions while reshaping your presentation by considering similarities and differences. Leave the expert table and return to your own group. Make your presentation to your group mates (p.29).

In the activity above, the necessity of active listening and respecting the ideas and decisions of others is emphasized. Active listening can be associated with Schwartz's (1996) value of harmony because it requires "being polite", which is one of the sub-values of this value. Respecting the ideas and decisions of others requires being virtuous, understanding, and tolerant. In this respect, this activity can also be associated with Schwartz's (1996) value of universalism.

Friction with Examples from the Past

A tactical genius, Fatih Sultan Mehmet gave great importance to science. His preparations for the conquest of Istanbul also show that he benefited from the science and technology of the age he lived in. One of the difficulties encountered during the conquest was the enemy forces chaining the Golden Horn Strait and preventing the Ottoman ships from passing through it. However, Fatih Sultan Mehmet suggested a surprising but scientific solution such as "moving the ships by land". The rolling motion of the logs was used to enable the ships to move on land. In addition, these logs were well oiled so that the ships could move more easily. The ships were moved by land in this way and lowered into the Golden Horn. This event was an important turning point in the conquest of Istanbul (p.82).

These statements describe Fatih Sultan Mehmet's determination and genius in finding scientific solutions for the conquest of Istanbul despite all the difficulties experienced. This situation is related to Schwartz's (1996) value of success. The fact that he discovered an extraordinary method for national security, peace and stability shows that Fatih Sultan Mehmet had the values of security and self-direction, which are Schwartz's (1996) values.

Three-Dimensional Cell Model, Cell Analogy and Journey to the Organism

Determine the appropriate materials that will represent the cell structures you will model. Obtain these materials by sharing the task with your friends.

Establish a connection between the cell structure and other organelles with the example you have chosen. Write the results you have reached in the table below by helping your friends and making a joint decision.

Considering the relationship between organism-system-cell-tissue-organ, compare these concepts to examples of houses, neighbourhoods, districts, provinces and countries. Create a travel text with the help of your group friends regarding this analogy. (p.105, p.106, p.108).

Among the activities above that can be considered under the same Schwartz value, the necessity of sharing tasks is emphasized in the "Three-Dimensional Cell Model" activity, while the necessity of helping each other is emphasized in the other two activities. Students sharing tasks and helping each other is related to Schwartz's (1996) value of benevolence. Sharing tasks is related to the "being responsible" sub-value of the benevolence value and helping each other is related to the "being helpful" sub-value.

The First Things That Come to Our Minds When We Think of Light Sources

Let's share the first things that come to our minds about the characteristics of natural and artificial light sources with our friends.

Let's listen to our friends' ideas respectfully (p.16). In this activity, respectful listening is associated with Schwartz's (1996) value of harmony because it requires "being polite," which is one of the sub-values of this value.

The Progress of Light

Umut loved researching and discovering new things. He would ask questions everywhere he was curious about, and if he couldn't get an answer, he would research it himself and try to reach a conclusion. This made him very happy (p.16).

With these expressions, it is stated that the student named Umut is curious about doing research and learning what he does not know. This expression aims to instill the characteristics that Umut has in students. In this respect, it can be associated with Schwartz's (1996) self-direction value.

Shadows in Daily Life

Let's give examples of shadow length changes we encounter in daily life. Let's listen to our friends' ideas respectfully (p.38).

This activity emphasizes the necessity of active listening and respecting the ideas of others. Active listening can be associated with Schwartz's (1996) value of harmony because it requires "being polite", which is one of the sub-values of this value. Being respectful of the ideas of others requires being virtuous, understanding, and tolerant. In this respect, this activity can also be associated with Schwartz's (1996) value of universalism.

Discussion Groups

Let's create a discussion environment by considering that our friends may have different ideas.", "Let's support our friends and help each other in this process (p.60).

The above statements refer to the importance of being respectful of others' ideas and helping each other. Being respectful of others' ideas requires being virtuous, understanding, and tolerant. In this respect, it can be associated

with Schwartz's (1996) value of universalism. Students' helping each other and supporting each other is related to the "helpfulness" sub-value of Schwartz's (1996) value of benevolence.

Particle Demonstration of Matter

Let's share with our group mates the material we represent as a group and create models representing particles. Let's prepare a demonstration text with our group mates regarding the state of matter we will represent (p.62).

This activity focuses on the necessity of sharing tasks. Students sharing tasks is related to the sub-value of Schwartz's (1996) value of benevolence, "being responsible".

Item Labels, What Happened to the Candle? What Happened to the Water? Let's Draw a Circuit Diagram

Let's leave the materials used and the laboratory area clean after the experiment. Let's follow the laboratory rules (p.61-p.76-p.77-p.115).

In all the activities above, it is emphasized that laboratory safety rules should be followed and that the environment should be clean. These elements, which are essential for the safety of individuals and the continuation of social order, are related to Schwartz's (1996) security values.

Energy Friendly Homes

Let's be careful to refer to reliable scientific sources when designing a heat insulation model, let's express our thoughts freely to our friends during this process, let's not forget that we can make the process more efficient by helping our friends (p.93).

The above statements emphasize the importance of students adopting a scientific approach while designing, choosing appropriate resources for their own purposes, and expressing their ideas freely. In this respect, it can be said that these statements are related to Schwartz's (1996) self-directed values. In addition, the "helpfulness" sub-value of the benevolence value draws attention in these statements.

Let's Draw a Circuit Diagram

Let's decide with our group members and draw a common circuit diagram, let's listen to our friends' feelings and thoughts carefully during this process, let's carry out experiments responsibly without postponing our plans during this process (p.114).

These statements mention the necessity of active listening and being responsible. Active listening can be associated with Schwartz's (1996) value of harmony because it requires "being polite", which is one of the sub-values of this value. The sub-value of "being responsible" is related to the value of benevolence.

How Do We Change the Brightness of a Light Bulb? Let's Group Waste Materials

Let's think about the question "What applications can be used to change the brightness of a light bulb in an electrical circuit?" Let's share what we wrote and/or drew about the first things that come to mind with our group mates. Let's also listen to our friends' ideas respectfully. Let's examine the waste materials we brought and separate them according to their similar characteristics. In the meantime, let's be careful to express our ideas to our friends in a respectful manner (p.121, p.139).

In both above activities, the need to be respectful of others' ideas is emphasized. These expressions can be associated with universalism, which includes the sub-value of "being virtuous", which is a result of being understanding and tolerant.

Recycling Adventure

Let's plan our presentation preparation process effectively and complete our task on time (p.145).

With these statements, students are emphasized to be self-disciplined and responsible. This situation can be associated with Schwartz's (1996) values of benevolence.

Schwartz values in design learning units

Moon Phases Model

Make a model representing the phases of the Moon using materials of your own choosing. You can make this process more efficient by helping your friends (p.29).

In the activity above, students were advised to take responsibility in model making and to help each other, which is an indicator of benevolence. This situation can be associated with Schwartz's (1996) values of benevolence.

Our Earth and Our Neighbours in the Sky

Without delaying your plans, work steadily and complete your model within a week and present it to your friends (p.40).

In this activity, students are expected to be responsible and complete the model successfully. This can be associated with Schwartz's (1996) values of benevolence and success.

I am developing a model

Design an original model that will show the relative movements of the Sun, Earth and Moon, as well as their volumetric sizes. While designing your model, conduct research from reliable scientific sources (p.40).

In the above activity, the importance of students adopting a scientific approach while designing, selecting appropriate resources for their own purposes and designing a creative model is emphasized. In this respect, it can be said that these statements are related to Schwartz's (1996) self-direction value.

I Design a Dynamometer

Make an original dynamometer model using the materials you will determine with your group. You can make this process more efficient by helping your friends. Test your model when you have completed it and improve it by comparing it with your friends' models. Work with determination and perseverance, complete your model within a week and present it to your friends completely (p.62).

The importance of students being able to design a creative model is emphasized in the activity. In this respect, it can be said that these statements are related to Schwartz's (1996) self-directed values. With these statements, students are also expected to be helpful, responsible and complete the model successfully. This situation can be associated with Schwartz's (1996) values of benevolence and success.

We Design Our Own Vehicle

Design a vehicle that can move when released from a ramped surface. Determine your work plan and material list for the vehicle you will design with your group mates. Distribute tasks within the group. Each group member should focus on the assigned tasks and fulfill their responsibilities. It is important to be determined and adopt solution-oriented approaches in the face of difficulties (p.84).

In this activity, students are expected to be responsible by sharing tasks. This situation is related to Schwartz's (1996) value of benevolence. These expressions also indicate the sub-value of success, "being ambitious", and the sub-value of self-direction, "being independent and creative".

Schwartz values in Scholars' learning units

Unit I, The Scholars' Learning units

Biruni determined when the seasons began from the movements of the Sun. He found the diameter of the Earth very close to today's value. Fergani was the first scholar in the history of science to discover that the Sun was a moving celestial body. The movements of celestial bodies were known until his time. However, Fergani stated that the Sun also rotated on its own axis from west to east. Ali Kuşçu put forward the idea that the planets moved around the Sun in certain orbits. He calculated the distances between the planets and produced the first map of the Moon. Because of these studies, a region of the Moon was named "Ali Kuşçu". Cacabey had a madrasah established in Anatolia with his own name. He pioneered the training of many Scholars here. Due to his interest in astronomy, he turned this madrasah into an astronomy school. The madrasah was also used as an observatory and observations of celestial bodies were made here (p.47).

These statements refer to the discoveries and studies of Biruni, Fergani, Ali Kuşçu and Cacabey, who had deep curiosity and interest in the field of astronomy. This interest and curiosity, for example, led Cacabey to establish an observatory, that is, to act in the field he was interested in. Fergani's discovery of the unknown by building on known knowledge shows that he has creative thinking skills. These statements are related to Schwartz's (1996) self-direction value. Cacabey's leadership in raising many scientists shows that he had authority and social power and that he was accepted by the people. Biruni's achievements beyond the conditions of that period (finding the diameter of the Earth very close to today's value) proves that he was an authority and led the society thanks to his foresight in the field of astronomy. The existence of a lunar region known as "Ali Kuşçu" is a result of Ali Kuşçu's

great contributions to the scientific community thanks to his knowledge and skills in astronomy. This result is due to Ali Kuşçu having a respected place among scientists and being seen as an authority in his field. In these respects, these statements can be associated with Schwartz's (1996) power value. All of the scientists mentioned in the text are successful, competent and influential people in the field of astronomy. In this respect, the relationship between these statements and the success value can be mentioned.

Unit II, The Scholars' Learning units

Leonardo da Vinci, known as the important philosopher, architect, engineer, mathematician, musician, inventor, astronomer, writer and painter of the period, also worked on friction force. Leonardo da Vinci discovered that the friction force increases as the contact surface increases. Biruni, put forward the first ideas on gravity before Newton. He concluded with his observations that the planets revolve around the Sun. Biruni put forward the idea that the "Earth rotates" 600 years before Galileo. He also stated that the center of the Earth pulls objects towards itself. The oldest known written record about robotics belongs to Cezeri. In terms of the history of world science, he is the first scientist to work on today's robotics. Cezeri's automatic machines using the properties of force formed the basis of some of today's machines. Hazini's measurements with the precision scale he invented and named "Mizanü'l-Hikmet (Scale of Wisdom)" are not much different from measurements made using today's technology. Thanks to this scale, very precise measurements of metals and precious stones could be made (p.91).

From these statements, it can be seen that Leonardo da Vinci, Biruni, Cezeri, Hazini are successful, competent and influential people about the world and the universe. In this respect, the relationship between these statements and the value of success can be mentioned. Thanks to their success, for example, Leonardo da Vinci discovered the direct proportion between the friction force and the contact surface, which is still valid today. Based on his effective observations, Biruni also discovered that the planets revolve around the Sun and that the Earth has a central gravitational force. Hazini's invention of the Scale of Wisdom is a similar success story. These characteristics of scientists who achieve success through discovery and investigation are related to Schwartz's (1996) self-direction value. Leonardo da Vinci's achievements in many different fields, from philosophy to painting, from mathematics to music, prove that he was in search of innovation and lived an exciting life. In this respect, it can be said that these statements are related to Schwartz's (1996) stimulation value. Biruni's achievements beyond the conditions of that period (proving that the Earth rotates) and being a pioneer prove that he was an authority and led the society thanks to his foresight. Similarly, the fact that Cezeri and Hazini formed the basis of today's technology shows that they have made great contributions to the scientific community, have a respected place, and are authorities in their fields. In these respects, these statements can be associated with Schwartz's (1996) value of power.

Unit IV, The Scholars' Learning units

Thales fixed a 2-meter stick vertically to the point where the shadow of one of the Egyptian pyramids ended on a sunny day. He then calculated the height of the pyramid using the length of the stick, its shadow, and the shadow of the pyramid. Eratosthenes, who was a good observer, calculated the circumference of the Earth using the shadow phenomenon. Huygens was a Dutch mathematician and scientist who made important studies in the fields of mechanics and optics. Huygens tried to explain the way light spreads in transparent media with his studies between 1665-1695. "Kindi examined the shadow-light relationship and discovered that rays spread in straight lines based on his experiments and observations (p.47).

From the above statements, it is understood that Thales, Eratosthenes, Huygens and Kindi, who were curious, questioning and had strong observational powers, had the ability to break down complex problems they encountered during their research processes into pieces and find creative solutions with good observation and analysis and unlimited imagination. These characteristics played an important role in these scientists reaching their superior competence in the fields of mechanics and optics. These situations can be associated with Schwartz's (1996) values of success and self-direction. In addition, the fact that all the scientists mentioned formed the basis of today's knowledge shows that they made great contributions to the scientific community, had a respected place and were authorities in their fields. In these respects, these statements can be associated with Schwartz's (1996) value of power.

Unit V, The Scholars' Learning units

Nazzam stated that clouds are formed by evaporation of water, and that the amount of water on Earth always remains at a certain level as the water vapor in the clouds condenses and returns to the Earth. Cabir bin Hayyan conducted various experiments, focusing especially on evaporation and condensation. He put forward the view that substances are composed of different particles. Anders Celsius invented the most widely used temperature scale today, the centigrade. Celsius determined the freezing temperature of water as 0 ^{0}C and the boiling

temperature as 100 0C. Fahrenheit invented a modern thermometer in his time, based on the principle that the volume of liquids increases when heated. He accepted the lowest temperature in his thermometer as the 0 point (p.99).

These expressions refer to the ability of Nazzam, Jabir bin Hayyan, Celsius and Fahrenheit to conduct research with deep curiosity and interest about the world and the universe and to observe their surroundings patiently, ambitiously, determinedly and devotedly. This situation is related to Schwartz's (1996) success value. Characteristics such as Jabir bin Hayyan's conducting various experimental studies and Fahrenheit's invention of the thermometer are related to Schwartz's (1996) self-direction value. In addition, the fact that all of the aforementioned scientists form the basis of today's knowledge shows that they have made great contributions to the scientific community, have a respected place and are authorities in their fields. In these respects, these expressions can be related to Schwartz's (1996) power value.

Unit VI, The Scholars' Learning units

Prof. Burhanettin Sezerar is considered one of the pioneers in the field of electricity in Türkiye. The first works on electricity in our country were written by him. He provided electricity to many cities and towns in both Trakya and Anatolia. Nikola Tesla, the inventor with many inventions had ideas far beyond the time he lived in. He conducted studies on the wireless transmission of electricity. He developed many devices related to the production and transmission of electrical energy. Alessandro Volta, who had been interested in electricity for many years, discovered that an electric current passed through a conductive wire connected to two different metal pieces that he immersed in an acidic liquid without touching their ends. He later invented the battery called the "Volta pile." Thomas Alva Edison is an inventor and businessman who greatly influenced human life in the 20th century with his inventions. He developed devices in many areas such as electrical energy production, mass communication, sound recording, and cinema. Edison invented an electric light bulb in 1879, thus enabling the production of light bulbs that could be used safely in homes and thus enabled the illumination of homes (p.131).

The above statements mention the level of competence that Caesar, Tesla, Volta and Edison achieved with their success and ambition in the field of electricity. This situation is related to Schwartz's (1996) success values. Discoveries and studies such as the electrical devices developed by Tesla and Edison and the battery invented by Volta are related to Schwartz's (1996) self-direction value. In addition, the fact that all of the mentioned scientists formed the basis of today's electrical knowledge and technologies shows that they made great contributions to the scientific community, that they have a respected place and that they are authorities in their fields. In these respects, these statements can be related to Schwartz's (1996) power value.

Unit VII, The Scholars' Learning units

Mevlana defined the concept of environment during his lifetime. He warned people to be sensitive to the environment by stating that resources were not unlimited and that consumption should not be excessive. İbni Haldun explained the interaction between humans and the environment. He touched upon factors such as population density, industry and trade that affect the environment. He emphasized that people should have developed environmental awareness for human life not to be negatively affected. Benjamin Law developed the recycling of old clothes, fabrics and other clothing materials in his environment. These materials and fibers were recycled in a mixed way and contributed to the production of raw wool because of the process. August Ferdinand Mobius obtained the shape called the Mobius strip by turning the ends of a thin rectangular piece of paper and sticking them together. The Mobius strip was also the inspiration for the recycling symbol used today (p.157).

These statements refer to the competencies of Mevlana, Ibni Haldun, Law and Mobius in developing environmental protection awareness, using environmental resources effectively and living in unity with nature. These characteristics are related to Schwartz's (1996) values of success and universalism. Mevlana's action preference for being sensitive to the environment, Ibni Haldun's determination of goals regarding environmental awareness, Law's idea of recycling and Mobius' invention of ribbon are related to Schwartz's (1996) value of self-direction. In addition, Law and Mobius's establishment of the basis of recycling and their inspiration show that they have made great contributions to the scientific community, have a respected place and are authorities in their fields. In these respects, these statements can be related to Schwartz's (1996) value of power.

Schwartz values in information learning units

The Father of the Camera: The Dark Room

Ibni Heysem managed to image objects upside down in the dark room in his experiments with several light sources. Thus, he went down in history as the person who invented the first known camera, the 'dark room' (lensless camera) (p.18).

The above statements prove that Ibni Heysem shaped the world's history by inventing the first camera, that he achieved success beyond the conditions of his time, that he was an authority in the field of optics and that he pioneered society. This situation is related to Schwartz's (1996) values of self-direction, power and success.

Philosopher Democritus

Philosopher Democritus proposed in the 400s BC that matter is composed of particles. Democritus explained his view as follows: Philosopher Democritus in the 400s BC said, "Take an apple and cut it in half, then cut the resulting half apples in half, and continue dividing. If you continue dividing like this, eventually there will come a point where you will get a piece that is so small that you can no longer divide it" (p.57).

In the period when the possibilities and measurement devices were insufficient, Democritus's assertion of the view that the smallest elementary particle constituting matter is indivisible is an indication of his certain competence in the scientific field. In this respect, it is related to Schwartz's (1996) success value. In addition, Democritus's curious and independent studies enabled him to discover the most fundamental knowledge of modern chemistry, the particulate structure of matter. In this respect, it is related to Schwartz's (1996) self-direction value.

CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

In the discovery learning units, a total of 12 values were determined, namely "success" (f=5), "power" (f=3), "self-direction" (f=3), "stimulation" (f=1). In this learning units, it was concluded that the "success" value was the most emphasized value, while the values of "Conformity", "Universalism", "Benevolence", "Tradition", "Harmony" and "Security" were not included at all. This result is like the result of Aytekin (2015), who stated that the values of success and power were the most frequently encountered values in the 5th grade Turkish textbook. Akkaya (2014), who examined the book called Keloğlan Tales, also determined that the values of success and power were the most frequently encountered values. Taçyıldız (2022) also stated that the value of success was the most frequently included in the 8th grade Turkish textbooks.

In the activity learning units, a total of 20 values were identified, namely "benevolence" (f=6), "harmony" (f=4), "universalism" (f=4), "self-direction" (f=3), "security" (f=2), "success" (f=1). In this learning units, it was concluded that the value of "benevolence" was the most emphasized value, "harmony" and "universalism" values followed the value of "benevolence", and the values of "Power", "Conformity", "Stimulation" and "Tradition" were not included at all. In the design learning units, a total of 10 values were identified, namely "benevolence" (f=4), "success" (f=3), "self-direction" (f=3). In this learning units, as in the activity learning units, it was concluded that the value of "benevolence" was the most emphasized value, while the values of "power", "conformity", "stimulation", "universalism", "tradition", "harmony" and "security" were not included at all. These results are like the results of the study conducted by Şakiroğlu (2020) and Kesimci (2024). Şakiroğlu (2020), who examined the 6th grade Turkish textbook, stated that the values of benevolence and universalism were frequently used values; Kesimci (2024), who examined the books of Aşıklardan Halk Hikayeleri, found that the value of benevolence was used the most.

In the Scholars' learning units, a total of 20 values were identified, namely "self-direction" (f=6), "power" (f=6), "success" (f=6), "stimulation" (f=1) and "universalism" (f=1). In this learning units, it was concluded that "self-direction", "power" and "success" values shared the position of the most emphasized values, while "benevolence", "conformity", "tradition", "harmony" and "security" values were not included at all. Karagöz (2017) also stated that self-direction value was among the most frequently included value groups in his review of the work titled Turkish tales.

In the information learning units, a total of 5 values were determined as "success" (f=2), "self-direction" (f=2) and "power" (f=1). In this learning units, it was concluded that "success" and "self-direction" values were the most emphasized values, while "stimulation", "conformity", "universalism", "benevolence", "tradition", "harmony" and "security" values were not included at all.

As summarized in **Table 2**, total of 67 values were determined in the learning units included in the 5th grade science textbooks. Of these values; "success" (f=17) and "self-direction" (f=17) were the most frequently included values, while these values were followed by "power" (f=10), "benevolence" (f=10), "universalism" (f=5), "harmony" (f=4), "stimulation" (f=2) and "security" (f=2), respectively. Of the 10 values included in the Schwartz (1996) value typology, the values of "conformity" and "tradition" were neglected in the learning units included in the 5th grade science textbooks.

Table 2. The Schwartz values in the learning units in the 5th grade middle school science textbooks prepared within the framework of TCEM

Learning units	Schwartz Values Found in the Learning units							
	Power	Stimulation	Self-direction	Universalism	Benevolence	Harmony	Security	Total
Discovery	3	1	3	-	-	-	-	12
Activity	-	-	3	4	6	4	2	20
Design	-	-	3	-	4	-	-	10
Scholars'	6	1	6	1	-	-	-	20
Information	1	-	2	-	-	-	-	5
Total	10	2	17	5	10	4	2	67

As a result, it was determined that most of the Schwartz values are embedded in the 5th grade science textbooks prepared within the framework of TCEM except two values. By involving most Schwartz values inside, it can be implied that the 5th grade science textbooks prepared within the framework of TCEM provides insights for educators aiming to increase their value consciousness. Correspondingly, teachers can adopt approaches that integrate both cognitive and moral dimensions of science learning to be in parallel with the TCEM vision. Science teachers are suggested to integrate socio-scientific issues, encourage classroom discussions, link science to everyday life, develop moral reasoning, and incorporate interdisciplinary collaboration.

REFERENCES

Akkaya, N. (2014). Keloğlan masallarında yer alan değerlerin incelenmesi. *The Journal of Academic Social Science*, 3, 312–324.

Aytekin, M. (2015). *Ortaokul Türkçe ders kitaplarının değer iletimi açısından incelenmesi* (Yüksek lisans tezi). Dokuz Eylül University, İzmir.

Bakırcı, D. C., & Biber, A. Ç. (2022). Mathematical values in turkish high school mathematics textbooks. *Asian Journal of Instruction, 10*(1), 1-13. https://doi.org/10.47215/aji.1004395

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, 2, 8–14. https://doi.org/10.1016/j.npls.2016.01.001

Crabtree, B. F., & Miller, W. L. (1999). *Doing qualitative research*. Sage Publications.

Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative research*. Prentice Hall.

Çepni, S. (2007). *Araştırma ve proje çalışmalarına giriş*. Celepler Publ.

DeHart, J. D. (2022). Crafting a visual review of the literature. *American Journal of Qualitative Research, 6*(2), 108-114. https://doi.org/10.29333/ajqr/12128

Demir, B. Ö., & Özer, B. (2023). Ortaokul fen bilimleri ders kitaplarının değerler açısından incelenmesi. *Türkiye Eğitim Dergisi*, 8(2), 264–284.

Dilmaç, B., Bozgeyikli, H., & Çıkılı, Y. (2008). Öğretmen adaylarının değer algılarının farklı değişkenler açısından incelenmesi. *Değerler Eğitimi Dergisi*, 6(16), 69–91.

Filiz, S. B., & Sel, B. (2018). The examination of values in the human rights, citizenship and democracy textbook. *Asian Journal of Instruction, 6*(2), 1-17.

Kahyaoğlu, M., & Kırıktaş, H. (2015). Ortaöğretim öğrencilerinin çevresel davranış ve düşünceleri ile bireysel değerleri arasındaki ilişkinin incelenmesi. *Marmara Coğrafya Dergisi*, 32, 88–105.

Kalgı, M. E., İnan, A., & Özen, M. (2020). Lisans öğrencilerinin değer yönelimleri: Karşılaştırmalı bir analiz—Van Yüzüncü Yıl Üniversitesi örneği. *BEÜ İlahiyat Fakültesi Dergisi*, 7(2), 559–580.

Karagöz, B. (2017). Naki Tezel'in Türk Masalları adlı kitabının değerler açısından analizi. *Ana Dili Eğitimi Dergisi*, *5*(3), pp. 534-556.

Karagöz, B. (2017). Naki Tezel'in *Türk Masalları* adlı kitabının değerler açısından analizi. *Ana Dili Eğitimi Dergisi*, 5(3), 534–556.

Kesimci, N. (2024). Geçmişten günümüze Türk toplumunda değer aktarımı: Aşıklardan halk hikâyeleri üzerinden bir analiz. *Socrates Journal of Interdisciplinary Social Research*, 10(40), 15–30.

Körükçü, Ö., Kapıkıran, N. A., & Aral, N. (2016). Resimli çocuk kitaplarında Schwartz'ın modeline göre değerlerin incelenmesi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, 1(38), 133–151.

Kuşdil, M. E., & Kağıtçıbaşı, Ç. (2000). Türk öğretmenlerinin değer yönelimleri ve Schwartz değer kuramı. *Türk Psikoloji Dergisi*, 15(45), 59–80.

Milli Eğitim Bakanlığı (MEB). (2024a). *Türkiye Yüzyılı Maarif Modeli uygulamasına ilişkin genelge*.

MEB. (2024b). *Türkiye Yüzyılı Maarif Modeli yaşam projesi tanıtımı*.

MEB. (2024c). *5. sınıf fen bilimleri ders kitabı*.

MEB. (2024d). *Erdem-Değer-Eylem çerçevesi*.
MEB. (2025a). *5. sınıf ders kitabı tanıtım videosu*.
MEB. (2025b). *Türkiye Yüzyılı Maarif Modeli öğretim programları ortak metni*.
MEB. (2025c). *Temel eğitim ders broşürleri*.
Merriam, S. B., & Grenier, R. S. (2019). *Qualitative research in practice: Examples for discussion and analysis*. Jossey-Bass.
Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage Publications.
Özdemir, E. (2023). Fen bilimleri ders kitaplarının içerdiği kök değerler açısından incelenmesi. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi*, 56, 504–528.
Reuter, T., & Leuchter, M. (2022). Examining kindergarten children's testing and optimising in the context of a gear engineering task. *European Journal of STEM Education, 7*(1), 04. https://doi.org/10.20897/ejsteme/11827
Rasmitadila, R., Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia. *Journal of Ethnic and Cultural Studies*, *7*(2), 90–109. https://doi.org/10.29333/ejecs/388
Schwartz, S. (1996). Values priorities and behavior: Applying a theory of integrated values systems. In C. Seligman, J. M. Olson, & M. P. Zanna (Eds.), *Psychology of values: Ontario Symposium* (pp. 1–24). Lawrence Erlbaum Associates.
Şakiroğlu, Y. (2020). 6. sınıf Türkçe ders kitabının değer aktarımı bağlamında incelenmesi. *Türkiye Eğitim Dergisi*, 5(1), 145–161.
Taçyıldız, G. (2022). *8. sınıf Türkçe ders kitaplarının değerler eğitimi açısından incelenmesi* (Yüksek lisans tezi). Sivas Cumhuriyet University, Sivas.
Ünal, S., & Benzer, A. İ. (2024a). Ortaokul 5. sınıf fen bilimleri ders kitaplarının değerler açısından incelenmesi. *Educational Academic Research*, 53, 65–79.
Ünal, S., & Benzer, A. İ. (2024b). Değerler açısından ders kitaplarının incelenmesi: Ortaokul 6. sınıf fen bilimleri ders kitapları örneği. *Bayburt Eğitim Fakültesi Dergisi*, 19(41), 1549–1574.
van der Graaf, J., Segers, E., & Verhoeven, L. (2018). Experimentation abilities in kindergarten children with learning problems. *European Journal of STEM Education, 3*(3), 13. https://doi.org/10.20897/ejsteme/3873
Yıldırım, A., & Şimşek, H. (2005). *Sosyal bilimlerde nitel araştırma yöntemleri* [Qualitative research methods in social sciences]. Seçki Yayıncılık.
Yılmaz, E., & Kıran, D. (2023). Ortaokul fen bilimleri ders kitaplarının değerler eğitimi bakımından incelenmesi. *Cumhuriyet Uluslararası Eğitim Dergisi*, 12(1), 29–45.
Yılmaz, Z., & Yıldırım, H. İ. (2023). Fen bilimleri ders kitaplarının değerler açısından incelenmesi üzerine bir araştırma. *Türk Eğitim Bilimleri Dergisi*, 21(2), 933–958.

