



Classroom Teachers' Opinions on the Acquisition of Scientificness Value in Social Studies Lesson

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ABSTRACT

The aim of this study is to determine the opinions of classroom teachers about gaining scientificness value in the primary school 4th grade Social Studies curriculum. Although the research is qualitative research, the approach adopted in the study is the phenomenological (phenomenology, phenomenology) pattern. The working group of the research consists of 13 classroom teachers working in private and public schools. The study group was determined by the criterion sampling method, which is a purposeful sampling type. The data of the study were collected by semi-structured interview technique based on qualitative research, and content analysis method was used in the analysis of the data obtained as a result of semi-structured interviews with the participants. The data obtained through the analysis were collected under main and sub-themes. According to the findings, it was revealed that classroom teachers made definitions with the meanings attributed to scientificness value, knowledge and individual. In addition, they stated that the Social Studies curricula were insufficient in scope, as well as their sample activities and practices regarding the value of science. Although the classroom teachers gave importance to gaining scientificness value in the learning and teaching environment, it was concluded that they were not sufficient about how to apply them. Classroom teachers think that the most effective factors in the transfer of scientificness value are the family and the teacher, followed by the method, material and environmental factors.

ARTICLE INFO

Article History:

Received: 15.09.2023

Received in revised form: 25.09.2023

Accepted: 17.10.2023

Available online: 20.10.2023

Article Type: Research Article

Keywords: Value, Scientificness Value, Values Education, Social Studies.

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1. Introduction

Advancing technology has significantly accelerated education in the processes of knowledge creation and knowledge transfer (Arıkan and Aladağ, 2021; Güneş et al., 2021). People can easily and swiftly access and convey information. As the exchange of information between individuals has sped up, interpersonal relationships have weakened and taken a secondary position. While information communication tools facilitate knowledge transfer, they fail to transmit the existing values in society. This deficiency has underscored the importance of values education in educational institutions (Çağlar, 2010).

Instilling the values accepted by societies in individuals and internalizing those values to shape their behavior according to them will foster love, friendship, happiness, freedom, peace, and ultimately create an environment of well-being, ensuring the perpetuation of societies. Otherwise, people will utilize knowledge for actions that are not beneficial to society and the environment. They will cling to an egotistic lifestyle, never forsaking the insatiable desire for more, neglecting the needs of the majority,

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and continuing irresponsible production and consumption habits without considering health and the environment. By misusing scientific knowledge and technologies meant for the benefit of society, we will inadvertently pave the way for a crisis, leading to the corruption of human values and endangering all living species and the environment (Doğanay, 2007). Therefore, values can be defined as the most crucial building blocks that ensure the continuity of society.

Value refers to the shared thoughts, purposes, fundamental moral principles, or beliefs that the majority of a social group or society deems correct and necessary for the preservation, unity, functioning, and continuity of their existence (MEB, 2005). In this sense, it would not be wrong to state that values are norms embraced by society. Values provide guidance for activities, and value systems serve as general frameworks applied to make decisions in cases of contradictions (Çileli, 1990).

As a term, "*values*" refer to our standards and principles that form our judgments about objects, individuals, ideas, situations, and actions, categorizing them as good, bad, desirable, undesirable, and similar evaluations (Halstead and Taylor, 2000; cited in: Yazıcı, 2006). In this context, values determine people's thought structures and their perspectives on life and events. Values, to some extent, shape an individual's life trajectory.

In general terms, values are abstract concepts that guide us in distinguishing between good and bad, influencing and determining our behaviors, personalities, and even our social status as we progress on the path they indicate.

It is known that values constitute the foundation of all social institutions that constitute the social structure. The family, which is the most fundamental institution in society, plays significant roles in adopting, disseminating, preserving, and transmitting social institutions and values to the next generation. Additionally, the primary mechanisms through which values are expressed in a society are the social roles that individuals take on. These roles are closely related to the stratification system and the social processes that form the social structure of society. Moreover, the determination of good and bad in a society, as well as the formulation of ideal thinking and behavioral ways, are all shaped by values (Özensel, 2003). As such, values hold a crucial place in society and serve various functions. According to Aydın and Akyol Gürler (2012), these functions can be listed as follows:

- They carry historical accumulations from the past to the present.
- They are accepted by the majority.
- They are used in decision-making and selection situations.
- They are mechanisms that control social life.
- They play an important role in the transmission of culture from generation to generation.
- They emerge in interaction with the environment or other individuals.
- They influence behaviors and attitudes.
- They have a motivating and stimulating function in displaying desired and positive behaviors.
- They provide a common ground in situations with differences and conflicts.
- They can be learned and taught; they are not genetically inherent traits.
- They are experienced and maintained by people, making them inherently human.
- They limit impulses and actions that contradict society's expectations and structure.
- They are abstract in nature but manifest concretely in people's behavior, attitudes, and actions.
- They possess characteristics of change, extinction, and reemergence (Güzel, Candan, and Ergen, 2014).

The change in values occurs over time rather than suddenly. Values are not hereditary but are transmitted to the next generation through social roles. Values are learned from family, close surroundings, and through imitation or modeling from written and visual materials (Aral, 2008, 9).

The process of individuals' upbringing continues first within the family and later at school. As a social reality, each family consciously or unconsciously tries to transmit certain values to their children. The most important question here is "*which values should be transmitted at what age and how?*" Particularly from primary school age onwards, imparting certain values to individuals is among the most important tasks of our education system (Yel and Aladağ, 2009). At this stage, it is undeniable that values education is a very delicate process.

Values education is, in short, the activity of instilling values. When examined in more detail, values education is the explicit teaching of values (Hökelekli and Gündüz, 2007). Values are teachable and learnable phenomena and, above all, a matter of education (Arabacı and Tülin, 2013: 10). It is believed that value education will be more successful when carried out in schools in a planned and systematic manner. Schools are environments where the values acquired within the family can be further reinforced, and certain values can be imparted (Keskin and Öğretici, 2013).

Although all subjects in the primary education program aim to support citizenship values, it can be said that Social Studies has the most important mission in educating active and responsible citizens. In Social Studies, which deals with life, the process must be value-based, and it is inevitable to address values directly or within the subjects (Yaşar and Çengelci, 2012). Especially, the role of Social Studies in values education is significant since students can learn many issues related to the values of the society they belong to and how values shape our society as citizens.

In the Secondary Social Studies Curriculum, there are a total of 18 values aimed to be acquired by secondary education students. These values are: "*Fairness, Valuing Family Unity, Peace, Independence, Scientific Approach, Diligence, Solidarity, Sensitivity, Honesty, Aesthetics, Tolerance, Hospitality, Freedom, Respect, Valuing Health, Love, Responsibility, Cleanliness, Patriotism, Helpfulness*" (MEB, 2018). Some of these values are explicitly stated as values to be directly addressed in each learning area according to the grade level. The value of scientific approach, for example, is included in the 4th-grade Social Studies curriculum under the learning area of 'Science, Technology, and Society' as a value to be directly addressed.

'Science, Technology and Society' is one of the significant learning areas in the social studies program. In this learning area, students gain the ability to use technology in accessing knowledge and understand that creative, critical, and scientific thinking form the basis of developments in science and technology, and they grasp the impact of science and technology on social life. Furthermore, they learn about the extent to which technologies are related to their daily lives. Additionally, by acquiring knowledge about the development of science and technology from prehistoric times to the present, they make predictions about the effects of science and technology on society (Kaymakçı, 2007).

The Social Studies program, based on scientific thinking, emphasizes the use of scientific ethics in accessing, using, and producing knowledge. Through the Social Studies course, students use information and communication technologies while comprehending the development of science and technology and their effects on social life (MEB, 2009). As evident, the importance of science and the value of scientificness are clear in the Social Studies course. The role of the scientificness value in the Social Studies curriculum is due to its significance as one of the most crucial values of the new century. The importance of scientific work, scientific ethics, and the facilitating effects of science on life have gained significant importance in recent years.

According to Gücen (2014), the value of scientificness is one of the most effective values in acquiring skills such as critical thinking, creative thinking, problem-solving, questioning, distinguishing superstitions, establishing firm beliefs, researching the essence of the matter, and moving from imitation to verification.

To elaborate further, the value of scientificness encompasses elements such as active and independent thinking, not acting without thinking, acting with reason, being open to new ideas, supporting ideas, constantly considering reasons and evidence, attaching importance to the organization of ideas, questioning, producing solutions, expressing a problem, issue, or claim clearly, controlling their work, researching reasons and evidence that support the claims until enough evidence is found, doubting judgments until enough evidence is available, drawing conclusions, and applying these skills to similar situations (Mindivanlı, Küçük, and Aktaş, 2012).

Scientificity, the value of scientificity, is characterized by defining the facts and events in the subject under study, establishing causal relationships among them, being impartial, open to criticism, and accepting the possibility of error (Altunışık et al., 2010; Cited in Gücen, 2014). Individuals who have acquired scientific attitudes and skills are those who use reliable sources to access scientific knowledge, find and apply scientific knowledge and scientific thinking for both personal and societal purposes, and possess the information that will enable them to be effective and successful in their professional and social lives (Toğrol, 1998; Çepni, 1998; Cited in Gücen, 2014). In other words, the value of scientificness enables individuals to be actively engaged in solving the problems they may encounter in both professional and academic fields (Gündoğdu, 2001).

Karasar (1994) explained the characteristics that should be present in individuals who have acquired a scientific attitude and behavior as follows:

1. Open-mindedness: They can consider events from multiple perspectives. They can review and change their decisions when new evidence is found.
2. Skepticism: They critically examine, listen to, and evaluate events.
3. Seeks logic in opposing views: They search for what is correct in opposing views.
4. Independent in thoughts and observations: Their efforts are directed towards seeking the truth and expressing it correctly.
5. Can postpone decisions for evidence: They do not make decisions without sufficient evidence.
6. Persistent and diligent in their work: They are aware that seeking the truth is not easy, and they are persistent, meticulous, and organized in their work, giving attention to every detail.
7. Thinks in a connected manner: They look for causal connections between events and evaluate what they find.
8. Humble and considers probability in judgments: They always consider the possibility of being wrong.

In a person who has acquired scientificness value, the utilization of advanced skills such as critical thinking, problem-solving, and creative thinking is expected. With the power of "*free and scientific thinking*," one examines and evaluates beliefs, thoughts, or opinions without adhering blindly to any particular view or belief. With the attribute of being "*constructive and creative*," one takes the knowledge acquired from the past, evaluates it, contributes to it, and advances it further. In order to enable students to examine the presented alternatives, there is a need to develop skills such as critical thinking and questioning, in other words, to enhance their perspectives. Students should not become mere followers. Instead, they should be educated to question the purposes of knowledge, who it is for, and how it can be used in the world (MEB, 2010).

In our world, which is experiencing the era of knowledge, the incredible advancement of technology and science has led to an increase in knowledge sources and facilitated the sharing of information, exposing individuals and consequently society to a multitude of stimuli. Therefore, the aim of today's education system and educational programs is to provide multi-learning environments that enable individuals to access knowledge and to guide them in processing and internalizing knowledge, rather than passively receiving and storing information through an autocratic approach (Arıkan, 2019; Şahin and Kılıç, 2010).

Yeşilyurt and Kurt (2012) argued that the formal curriculum is less effective in the acquisition of the value of acting scientifically compared to other values and suggested that implicit curriculum and out-of-school factors should be used more in the acquisition of this value. Acun, Yücel, Önder, and Tarman (2013) examined the perceived importance of values within the scope of the research in which 92 teachers and 460 student parents were included. In the study, it was stated that even though the value of scientificness was considered more important by teachers than by parents, it was expressed as one of the least important values along with aesthetics and hospitality values by both teachers and parents. As a result of the research, it was suggested that more activities should be included in the programmes in order to gain the value of scientificness at a higher level. Yaşar, Kasa, and Gürdoğan Bayır (2015) stated in their study with pre-service classroom teachers that pre-service teachers described the value of scientificness as a universal value. Kuşçuoğlu and Aladağ (2019) stated that classroom teachers think that museums provide the value of scientificness. Gündoğan (2020) determined that the value of scientificness is one of the least preferred values among the values that should be given in the Life Sciences course according to prospective primary school teachers. The researcher also stated that teachers may have difficulty in presenting scientificness values with concrete activities. Bayram (2021) found that social studies teachers' views on scientific research methodology were inaccurate and inadequate and suggested that teachers should receive training on this subject. Taş (2022) stated that the values of scientificity, aesthetics and diligence were handled as complementary to each other in the social studies textbook. In addition, it was determined that scientificness was among the least included values in the textbook. The researchers stated that this can be explained by the fact that scientificness and scientific attitude are not fully established in society.

One of the fundamental goals of modern education is to equip students with a scientific way of thinking (Uygun and Arıkan, 2019). To raise students who question, research, solve problems, possess the discipline of scientific thinking, criticize, generate solutions to encountered problems, and strive to do better, it is necessary to impart scientific thinking skills to students (MEB, 2010). Therefore, there is a significant responsibility for class teachers, who are representatives of contemporary society, in transmitting the value of scientific thinking. For this reason, in this study, it is essential to determine the views of teachers, who are the actual implementers of the Social Studies Curriculum, regarding the process of instilling values included in the curriculum.

The aim of this study is to examine the opinions of classroom teachers regarding the incorporation of scientificness values into the Social Studies course. The research questions of the study are as follows:

1. What does the concept of "*Scientificness Value*" mean to classroom teachers?
2. How do classroom teachers perceive the effectiveness of the Social Studies curriculum in instilling scientificness values?
3. What are the opinions of classroom teachers regarding the factors that effectively promote scientificness values?
4. Why do classroom teachers consider it important to incorporate scientificness values?
5. What challenges do classroom teachers encounter in the process of instilling scientificness values?

2. Methodology

In this study, which examines the views of classroom teachers regarding scientificness value, the qualitative research design appropriate to the nature of the research, namely the "*phenomenological design*," has been employed. The phenomenological design focuses on phenomena that we are aware of but do not have an in-depth and detailed understanding of. Phenomena can manifest in various forms in our lived world, such as events, experiences, perceptions, orientations, concepts, and situations. However, this familiarity does not imply a complete understanding of the phenomena. The phenomenological approach provides a suitable research framework for investigating phenomena that

are not entirely foreign to us but whose full meaning we have not comprehended. (Yıldırım and Şimşek, 2006).

2.1. Study Group

The study group of this research consists of 13 classroom teachers, 7 female and 6 male participants. The study group was determined using the criterion sampling method, which involves studying cases that meet a pre-defined set of criteria (Yıldırım and Şimşek, 2006). In the selection of participants, classroom teachers who had taught the social studies course to primary school 4th grade students throughout their teaching careers as of 2018 were taken into consideration. The characteristics of the participants are presented in Table 1.

Table 1. Personal Information of the Participants

Participants	Gender	Profession Length of Service	Education Status	School type	Participation in a Programme Related to Values Education
Teacher 1	Female	8	Adnan Menderes University	Private	No
Teacher 2	Female	18	Selcuk University	Private	Yes
Teacher 3	Male	6	Trakya University	Private	No
Teacher 4	Male	6	Trakya University	State	Yes
Teacher 5	Female	6	Trakya University	State	No
Teacher 6	Male	37	Bolu Institute of Education	Private	No
Teacher 7	Male	3	Pamukkale University	State	No
Teacher 8	Male	3	Pamukkale University	State	No
Teacher 9	Female	16	Karadeniz Technical University	Private	No
Teacher 10	Female	21	Süleyman Demirel University	Private	Yes
Teacher 11	Female	7	Akdeniz University	State	Yes
Teacher 12	Female	16	Süleyman Demirel University	Private	No
Teacher 13	Female	7	Adnan Menderes University	Private	Yes

2.2. Data Collection Tools

In order to determine the views of classroom teachers regarding the scientificness value present in the Social Studies program, semi-structured interviews were conducted with the participants. The data

sources for phenomenological research are individuals or groups who have experienced and can express the phenomenon under investigation. At this point, data were collected from the participants who taught social studies to primary school 4th grade students throughout their teaching careers as of 2018. In this context, interviews serve as the primary data collection tool for phenomenological research. Interviews are a powerful method used to elicit individuals' perspectives, experiences, emotions, and perceptions (Bogdan and Biklen, 1992: cited in Yıldırım and Şimşek, 2006).

To enhance the validity of the study, the formulation of interview questions involved obtaining the opinions and suggestions of two subject field experts. Based on the experts' recommendations, the questions were restructured. A draft framework was created for the interviews, and a pilot interview was conducted. The pilot interview helped identify any shortcomings, such as the clarity of the questions, their alignment with the research objectives, and whether the interview captured the desired quality of data, according to the principles of phenomenological philosophy. As a result, the interview questions were further refined. The interviews lasted approximately 120 minutes in total. During the interviews, voice recordings were made by obtaining permission from the teachers who voluntarily participated in the research. After each interview, the audio recording of the interview with the teacher was played to the relevant teacher and his/her approval was obtained by asking whether he/she wanted to make any additions. Then, the data obtained from the classroom teachers were transcribed into interview forms.

2.3. Data Analysis

The data obtained from the interviews were analyzed using "*content analysis*." Content analysis is defined as a systematic and repeatable technique where specific words in a text are summarized into smaller content categories based on certain rules. It determines and analyzes the presence, meanings, and relationships of certain words or concepts in a set of texts to draw inferences about the message conveyed in the text (Büyüköztürk, 2014). In this study, content analysis was employed to conduct an in-depth investigation of the views of classroom teachers regarding the scientificness value in the Social Studies course.

The stages of the analysis were as follows: (1) data coding, (2) identification of themes, (3) organization of codes and themes, and (4) interpretation and description of findings. Content analysis requires a thorough examination of the collected data and enables the emergence of themes and dimensions that were not previously apparent (Yıldırım and Şimşek, 2006).

In the first stage of data analysis, the interview forms were numbered from 1 to 13 (Teacher, 1, E). The coding and analysis of the qualitative data were carried out by the author of this study and another field expert. Both coders had previously conducted qualitative interviews and had experience in qualitative data analysis. The researchers first coded and categorised the data independently. Then, the codes and categories were discussed. A consensus was reached by discussing the conflicting codes and categories.

For the creation of codes, a "*coding within a general framework*" approach was preferred. This means that as data was read, new themes were added to the code list alongside the previously identified themes, completing the coding process for the data. After the classification of each code, names were given to these classifications, and sub-themes were reached. Finally, the categorization of sub-themes led to the identification of main themes (Patton, 2002). In order to ensure the validity and reliability of the data analysis, the process of data analysis was explained step by step and in detail.

In this study, five main themes were identified: (1) The Meaning Attributed to Scientificness Value, (2) The Role of the Social Studies Program in Instilling Scientificness Value, (3) Factors Effective in Transmitting Scientificness Value, (4) The Importance of Instilling Scientificness Value, and (5) Challenges in Transmitting Scientificness Value.

3. Findings

3.1. Findings Related to the First Sub-Purpose

In this section, the findings related to the sub-purpose "What does scientificness value mean for primary school teachers?" are presented.

Table 2. 1st theme: The significance attached to scientificness value

Sub Themes	Encodings	Kodlamalar
In terms of attributing meaning to knowledge		Based on cause and effect relationship, can be proved by experiments, the process that progresses by accumulation, has a high margin of accuracy, has certainty, based on evidence, in accordance with scientific methods, analysed, examined, reliability, can be based on a document
In terms of Attribution of Meaning to the Individual		High level learning models such as reasoning, perceiving, perceiving, thinking according to certain principles, an objective and critical perspective, research, questioning, creative thinking, problem solving, apart from presentation and lecture methods, being away from rote learning, based on contemporary educational approaches, thinking within the framework of logic, able to analyse and synthesise, rational,

According to the data presented in Table 2, many of the primary school teachers expressing their thoughts on scientificness value have defined it within the dimension of conceptual knowledge. One teacher (T,8,M) stated, "*For knowledge to possess scientificness value, its accuracy must be proven through numerous experiments.*" Another teacher (T,1,F) described scientificness value as, "*A process based on cause-and-effect relationships, verifiable through experiments, and progressing cumulatively.*" Similarly, another teacher (T,3,M) described it as, "*Corresponding to the concepts of reliability and accuracy.*"

Furthermore, some teachers defined scientificness value in terms of an inherent value that needs to be instilled in individuals. According to them, scientificness value guides individuals' approaches to thinking and shapes their actions in response to any problem situations. One teacher with code (T,11,F) stated, "*scientificness value is a virtue aiming to cultivate skills such as research, inquiry, creative thinking, and problem-solving in individuals. It emphasizes an individual's ability to handle situations logically.*" Similarly, another teacher with code (T,4,M) expressed the view that, "*Scientificness value can be understood as individuals critically analyzing the events and phenomena they encounter in their daily lives, perceiving them through the lens of reason, and acting based on their thinking abilities.*"

One teacher with code (T,2,F) also shared their evaluation on this topic, saying, "*Scientificness value, in my opinion, evokes higher-level learning models. It is a value built upon contemporary educational approaches, moving away from purely rote learning, utilizing methods such as presentation and interactive teaching.*"

Overall, the primary school teachers' perspectives on scientificness value encompass its connection to conceptual knowledge and its significance as a value to be nurtured in individuals, fostering critical thinking and problem-solving skills in the process.

3.2. Findings Related to the Second Sub-Purpose

In this section, the theme, sub-themes, and codings related to the sub-purpose "How do primary school teachers perceive the effectiveness of the Social Studies curriculum in instilling scientificness value?" are presented in Table 3.

Table 3. 2nd theme: The role of the social studies curriculum in instilling scientificness value

Sub Themes	Encodings	Kodlamalar
Regarding the Scope of the Curriculum	Inadequacy of content knowledge, giving more importance to other values, lack of scientificness value in the education system and curriculum of the country	
In terms of the adequacy of the curriculum	Intensity of learning outcomes, lack of in-depth coverage of topics, lack of importance, should become more effective, hearsay, good in theory, poor in practice, research studies should be included, research area and resources should be presented	
In terms of Age Level	From Grade 1 to Grade 4, should be given, should be included in pre-school studies, cause and effect relationship is difficult, should start in the family	
In terms of Implicit Curriculum	Teacher's encouragement to think about the subject with rich questions, almost no implicit curriculum implementation, science museum, space camp	
In terms of Changes in the Curriculum	Being included in the curriculum after 2005, being late, being 20 years behind as a country in technological and scientific developments worldwide	

According to the data in Table 3; Participant teachers are of the opinion that the value of scientificness is not adequately emphasized within the scope, i.e., content of the Social Studies program, which is considered as a fundamental building block in the transfer of values. Teacher coded as (T,13,F) expresses their opinion as follows: *"I am not well-informed about how much scientificness is present in the program. However, I believe it is not given much importance. I observe that values such as tolerance, empathy, justice, and respect for differences are given more emphasis."*

Similarly, regarding the incorporation of the value of scientificness, most of the classroom teachers find the Social Studies program insufficient. Teacher coded as (T,1,F) evaluates: *"When examining the Social Studies program in terms of incorporating the value of scientificness, the intensity of the content prevents in-depth exploration of the topics. The time allocated for the attainment of objectives is not sufficient for imbuing the subjects with scientificness value."*

Another teacher, coded as (T,10,F), remarks: *"It is limited to matching inventors with their inventions. It is unreasonable to expect students to design a technological product within one class hour. The understanding of scientificness value should not be confined to a single lesson or learning area. It should continue throughout the entire school life and be planned separately for each subject."*

Furthermore, teacher (T,7,M) states: *"When examining the principles of the Social Studies curriculum, I noticed that the value of scientificness is well-used 'in theory.' However, I do not think it is very successful in practice. Research is a fundamental element for scientificness. It is very difficult for students to find an environment and resources to conduct research and develop a scientific product or idea."*

According to the opinions of the participating classroom teachers, the value of scientificness should be instilled starting from before the preschool period through family education and continued to be nurtured within the school context. Additionally, they believe that scientificness, as it involves thinking skills, should be presented through activities that offer concrete experiences. Teacher coded as (T,13,F) evaluates: *"I don't know how much space it occupies in the programs at different grades. However, I believe it would be beneficial to have it from 1st to 4th grade and even in preschool education. The earlier we can introduce children to it, the better they will incorporate it into their lives."* Another teacher, coded as (T,1,F), expresses their opinion: *"The education of the value of scientificness, which will be carried on in life, should primarily start within the family."*

Several of the interviewed teachers also mentioned the importance of utilizing the implicit curriculum in the transfer of scientificness. According to (T,4,M), "Teachers consciously or unconsciously guide students towards research and critical thinking within their daily class routines, according to the constructivist approach. I believe this process starts from preschool or even earlier. When we start primary school, one of the first questions asked by our elders is, 'Is 1 kilogram of iron heavier than cotton?' Even this question signifies the importance of developing reasoning skills in both daily life and the implicit curriculum."

Teacher coded as (T,13,F) adds: "Unfortunately, the implementation of the implicit curriculum in our schools is almost non-existent. I think field trips to places such as science museums and space camps would also support the implicit curriculum and help instill the value of scientificness."

Taking note of program developments, teacher (T,6,M) states: "In my opinion, the fact that the value of scientificness was not included in the curriculum until 2005 indicates that we were late in doing so... The fact that our country is 20 years behind in global technological and scientific advancements is evidence of this delay."

3.3. Findings Related to the Third Sub-Aim

In this section, the findings related to the sub-objective "What are the opinions of classroom teachers about the factors that are effective in conveying the value of scientificity?" are presented. The theme and coding are given in Table 4.

Table 4. 3rd theme: Factors effective in transferring the value of science

Sub Themes	Encodings	Kodlamalar
Family	First and foremost, they should be role models and offer a richness of life, Family's perspective on science, visits to science museums and exhibitions, reading books, being a researcher	
Teacher	Following the family, being an example, being one of the cornerstones, being willing, having knowledge and skills, being encouraging, giving importance to the value of scientificity	
Student	Willingness, high readiness	
Material	Tangible materials, source books, written materials, presentations, all kinds of materials	
Method	Family history study, six-hat thinking technique, question and answer method, emphasising the sense of curiosity and idea generation, active learning, giving less space to direct expression, brainstorming, visual readings, creative drama, excursion, case study, storytelling, learning by doing, multiple intelligence theory, experiment, problem solving, discussion groups, project, presentation, observation	

According to the opinions of the participating classroom teachers, the most important factor in transferring the value of scientificness is the family, followed by the teacher, student, method, and materials.

3.3.1. Family

Teacher coded as (T,13,F) states: "The family is crucial in instilling the value of scientificness. From a young age, the family should act as a role model for the child and provide rich experiences. Education begins before school

in the family and continues during the school period as well. The family's perspective on science affects whether the learned value will be sustained outside of school as well. For example, family visits to science museums and exhibitions play a role in this continuity." Another teacher, (T,7,M), adds: "If family members read books and make efforts to research and access useful information, this positive attitude will also reflect on the student."

3.3.2. Teacher

Teacher coded as (T,13,F) states: "The teacher plays a direct role as one of the essential elements in imparting the value through the activities they conduct. They should possess the knowledge and skills that will motivate students during activities both inside and outside the school environment. Demonstrating the importance of scientificness through their behaviors and thinking patterns, and being an example to their students, will contribute to the internalization of the value by the students." Another teacher, (T,10,F), mentions: "When the teacher encourages critical thinking activities in class but does not allow criticism in any other subject or situation outside the lesson, this inconsistency can demoralize the child, reduce their curiosity, and discourage them from asking questions. The teacher should accept and support the product or idea designed or created by the student and provide encouragement for the subsequent steps."

3.3.3. Student

Teacher (T,11,F) mentions: "The willingness of students to participate in educational activities, their enjoyment during class activities, and their high readiness to engage will play a significant role in acquiring the value of scientificness."

3.3.4. Material

Regarding the impact of materials in transferring the value of scientificness, teachers express their views as follows: (T,6,M) states: "Any written, tangible, or visual material that explains the contributions of scientific developments to social life can be used. For example, an activity that starts with the question of how a system that predicts earthquakes in advance would benefit people can be supported with a video about earthquakes, followed by questions that encourage children to make inferences about the images before and after the earthquake. We can also teach science and scientificness through a simple cup of tea: by questioning the journey of the cup, the saucer, the tea, and the sugar to our table..."

(T,11,F) adds: "Especially considering the needs of the age group, we can use any type of material that comes to our attention and that can be useful. For example, educational videos, concept cartoons, posters, storybooks, educational films, etc."

3.3.5. Method

Teachers believe that the method is one of the effective factors in transferring the value of scientificness. For example, according to (T,4,M): "In teaching 4th-grade social studies objectives, lessons are generally based on the question-and-answer method. By asking questions, students' active participation in the lesson is encouraged, and the question-and-answer format naturally stimulates their thinking and reasoning. Additionally, brainstorming techniques are used to highlight curiosity and idea generation, directing students to think and produce. The Six Thinking Hats technique also guides students to think differently. In the family history study objective, students are expected to actively participate by conducting interviews and collecting evidence one-on-one. Here, students are asked to work like scientists."

(T,7,M) suggests: "For the value of scientificness, discussion groups can be formed, projects can be assigned, and students can be encouraged to make presentations. Internet-accessible resources, books, and magazines can also be used as materials."

(T,13,F) states: "To impart the value of scientificness, as with any other value, less emphasis should be placed on direct instruction, and more opportunities should be given for experiential learning through activities such as field trips, case studies, observations, experiments, problem-solving, brainstorming, visual reading, creative drama, storytelling, and so on. This allows students to engage in hands-on practices based on concrete evidence. It depends on the strengths of the teacher. The teacher must be able to establish a bridge between the value they are transmitting and the team they are transmitting it to."

3.4. Findings Related to the Fourth Sub-Aim

In this section, the themes, sub-themes and codes related to the sub-goal "Why is it important to acquire the value of scientificness according to classroom teachers?" are given.

Table 5. 4th theme: Importance of acquiring scientificness value

Sub Themes	Encodings	Kodlamalar
In terms of Contribution to Individuals	To be able to question, foresee, apply in different environments, thinking individuals, establishing cause and effect relationship, producing different ideas, reasoning, reasoning, reasoning, investigating the accuracy, to be able to produce a scientific product, to be able to do research, to be able to distinguish true and false data,	
In terms of Contributions to the Future and the Benefit of the Country	For the future of our country, thinking and producing generation, unity, solidarity, increase in welfare level, increase in production and efficiency, healthy life,	

According to the data in Table 5, classroom teachers believe that the contribution of imparting the value of scientificness to individuals is undeniable. Teacher (T,7,M) supports this idea by stating: "*For instance, the value of scientificness is crucial for individuals to be able to create scientific products in the future, conduct research, and distinguish between true and false information. It is essential for individuals to act based on evidence and reason rather than hearsay; to develop research, questioning, and problem-solving skills; and to progress on their own path by improving and broadening their horizons.*"

As a result of the interviews, according to classroom teachers, the value of scientificness is highly significant for the development and survival of our country and our future. The opinions of the participating teachers are as follows:

(T,2,F): "*We should raise individuals who think about the future of our country. We should even raise a generation that thinks and produces. To build a generation that takes pride in its past and can solidify its future with strong foundations, we should instill the value of scientificness.*"

(T,4,M): "*The era we live in is a period where science and technology are at the forefront. The winners of this era are people who think, reason, and come up with new and different ideas. When we look at daily life, we see that very diverse industries and fields have emerged. We see that people have achieved significant gains in areas we could never have imagined, thanks to their thinking and research efforts in fields they created. This situation clearly shows that critical thinking, research, reasoning, in other words, scientificness, is one of the essential values that must be instilled in today's world.*"

(T,6,M): "*First and foremost, valuing science and gaining the ability to think scientifically contribute to social cohesion and unity. Governments that incorporate proven truths into societal life lead to an increase in the standard of living. The productivity and efficiency of society increase, and a healthier living level can be attained.*"

3.5. Findings Related to the Fifth Sub-Aim

In this section, the findings related to the sub-objective "What kind of problems do classroom teachers face in teaching the value of scientificity?" are given. The theme and codes are given in Table 5.

Table 6. 5th theme: Difficulties in transferring the value of scientificness

Sub Themes	Encodings	Kodlamalar
In terms of family	Economic reasons, not giving importance, not allowing activities, low level of education, negative attitude, not showing support, lack of awareness, oppressive attitude,	

	religious and moral prohibitions, superstitious beliefs, political thought
In terms of students	Tendency to memorise information, habits, negative attitudes and behaviours, student level, difficulties in comprehension, lack of critical thinking habits, wrong prior learning
In terms of the Social Studies Program	Few activities, superficial presentation of the acquisitions, anxiety that the acquisitions cannot be completed, the expectation of the examination system
In terms of the teacher	Using traditional methods, teachers not having a good command of teaching this value, not planning the learning process well, test perspective, rote learning approach, oppressive attitude

The class teachers who participated in the interview expressed their experiences in transferring values and the difficulties they faced from the perspectives of family, students, curriculum, teachers, and other factors. Regarding the challenges related to conveying the value of scientificness from the perspective of families, the opinions of class teachers are as follows:

"The primary problem is the lack of emphasis on the value of scientificness within the family or the environment. Especially in families with low educational levels, this issue can be encountered. The family may have a negative attitude towards an activity that the child wants to pursue and may not provide the necessary support. For instance, not granting permission for extracurricular activities..." (T,13,F) "Preconceived ideas from families, superstitious beliefs, concepts related to sin and virtue, and sometimes misunderstandings due to political beliefs..." (T,12,F)

According to the participants, the students' opportunities create certain difficulties in conveying the value of scientificity. For example, teacher with code (T,1,F) states, *"The instructional methods and techniques that are effective in instilling scientificness value (research-based inquiry learning/argumentation-based science learning) sometimes lead students to memorize information instead of comprehending it, considering the context of attainment and class hours."* Meanwhile, (T,4, M) evaluates, *"For example, the negative attitudes and behaviors of students during the learning process can create difficulties."*

Participant (T,15,F) explains, *"The students' level, their difficulty in understanding, and their lack of critical thinking habits hinder their acquisition of scientificity."* Teacher (T,11,F) expresses the difficulties she faces in conveying the value of scientificness within the social studies program as follows: *"...the concern that the achievements are provided in a more superficial way and that the achievements cannot be accomplished, the expectation of the examination system..."*

One of the class teachers shares her views on the difficulties she experiences in conveying the value of scientificness:

"Teachers, in general, seem to have an inadequate understanding and instruction of this value. Firstly, the concept of scientificness should be emphasized, and what the value of scientificness entails should be taught. If the teacher hasn't planned the learning process well or is unable to manage the process effectively, it can lead to a negative situation. Teachers' reliance on traditional methods to convey information rather than facilitating environments for students to explore and experience the knowledge results in an inadequate transmission of this value." (T,1,F)

4. Discussion and Conclusion

In this study, five main themes have been identified. These themes are as follows: *"Meanings Attached to the Value of Scientificity," "The Role of the Social Studies Curriculum in Instilling the Value of Scientificness," "Factors Influencing the Conveyance of the Value of Scientificness," "The Importance of Instilling the Value of Scientificness,"* and *"Difficulties in Conveying the Value of Scientificness."*

The participating teachers provided definitions by attributing meanings to the value of scientificity, knowledge, and the individual. Teachers who focused on the definition related to knowledge attributed meanings such as being based on cause-effect relationships, being provable through experiments, having a high degree of accuracy, and being a cumulative and progressive process. On the other hand, teachers who emphasized definitions related to the individual made explanations about individuals possessing scientific thinking skills, such as analyzing events through critical thinking, reasoning, researching, questioning, creative thinking, problem-solving, and adopting an objective and critical perspective. It can be said that teachers who made definitions related to the individual were relatively more proficient in the value of scientificity compared to those who provided knowledge-based definitions. This is because values are principles that influence and guide individuals' behaviors and thought structures and are expected to be embodied by individuals in society. According to Ersoy (2006), the realization of values, which involves internalizing one's values and reflecting them in one's behavior and attitudes, is closely related to how an individual perceives reality. From this perspective, it can be argued that many skills required to seek and uncover the truth are encompassed within the scope of scientificity.

Regarding the effectiveness of the Social Studies curriculum in instilling the value of scientificity, class teachers who expressed their opinions highlighted that other values such as patriotism, respect, tolerance, and responsibility are more prominently present in the Social Studies program compared to the value of scientificity. According to Ünlü and Kaşkaya's (2018) study, social studies teachers ranked justice, honesty, and love as the top three values to be prioritized in school, while they placed aesthetics, thrift, and scientificity in the last three ranks. It can be observed that the value of scientificity is more often associated with and confined to subjects like Natural Sciences and other disciplines. However, science, technology, and society are essential components of the Social Studies program. In this learning domain, students acquire the ability to use technology to access knowledge and understand that creative, critical, and scientific thinking are the basis of developments in science and technology and their impact on social life. They also learn the extent to which technologies are related to their daily lives. Moreover, they gain knowledge about the development of science and technology from prehistoric periods to the present day and make predictions about the effects of science and technology on society (Kaymakçı, 2007).

According to the participating teachers, the effective activities and practices exemplifying the value of scientificity, which should be followed in effective educational environments, are insufficiently integrated into the curriculum. Acun, Yücel, Önder, and Tarman (2013) also emphasized in their study that values with lower attainability levels, such as scientificity, require more activities to be conducted to elevate them to higher levels and that the program is inadequate in this regard.

According to class teachers, the value of scientificity should be instilled starting from the preschool level rather than the primary school level. Even at younger ages, parents should take significant responsibilities in helping their children embrace and internalize the value of scientificity and adapt to the technology era. As the world increasingly relies on science and technology, it is crucial for individuals to become scientifically literate. Many studies highlight the importance of introducing science and scientific concepts to children from an early age through early life experiences. Therefore, the effects of processes such as family, school, curriculum, and implicit curriculum are considered crucial in effectively instilling the value of scientificity in early childhood (Virginia Association of Science Teachers [VAST], 2010).

The implicit curriculum, which includes extracurricular activities such as excursions, observations, museum and exhibition visits, is highly conducive to acquiring the value of scientificity for children. Through such visits to science museums and environments like space camps, children will have the opportunity to develop research, investigation, exploration, curiosity, and questioning skills.

Another finding suggests that the implicit curriculum should support the transfer of the value of scientificity because it is limited in the Social Studies program. Additionally, students with teachers

who possess qualities of being researchers, thinking ethically and objectively, and having creative ideas will also develop thinking skills through the implicit curriculum. If the teacher can serve as a role model in these aspects and encourage students to think with diverse question types, the value of scientificness can be effectively conveyed.

According to class teachers, the most influential factors in conveying the value of scientificness are family and teachers, followed by methods, materials, and environmental factors. They believe that family and teachers play the most significant role in instilling the value of scientificity. As for the methods, they emphasize the use of various activities such as case studies, the six thinking hats technique, brainstorming, storytelling, field trips, problem-solving, projects, presentations, and multiple intelligences. Turan and Ulusoy (2016:24) suggest that activities such as conducting surveys, oral history studies, interviews, utilizing the library and the internet, conducting experiments, and making observations should be employed. These activities should enable students to construct their own knowledge and reach conclusions. To instill the value of scientificity, the effective use of scientific research and problem-solving methods is essential. Although the participating class teachers have ideas about certain methods and strategies for conveying the value of scientificness to students, they seem to lack knowledge and expertise on how to implement them effectively.

One of the reasons why class teachers consider the importance of instilling the value of scientificness is because of the contributions it brings to the individual. It is essential for individuals to base their actions not on hearsay but on evidence and reason. It enables them to develop research, inquiry, and problem-solving skills and empowers them to improve and advance their own path rather than relying on others. As stated by Özden (2012, p. 23), nurturing individuals who can think positively and act proactively about science and scientific thinking is crucial for both their personal development and the progress of the country in the field of science and technology.

The universal value of scientificity, as emphasized in the educational program, is seen as significant in raising individuals who "have acquired the methods used in producing scientific knowledge and are effective and productive in social life" (TTK, 2004). Based on the discussions, class teachers highlighted the importance of raising individuals who can think, reason, and come up with new and innovative ideas, especially in today's age where science and technology are at the forefront and the demands of the era necessitate such abilities.

The advancements in science and technology in modern times bring about profound changes and developments that deeply impact people's lives. While some of these advancements elevate living standards and conditions, others make living conditions more challenging and even threaten the future. Therefore, societies must equip future generations with the knowledge and skills to manage these changes and developments and deal with potential threats. As a result, education is burdened with high expectations in today's world, and one of its fundamental objectives is to raise highly competent individuals (Duman, 2004, p.1).

Countries aspiring to progress in science should develop programs that place science at the core of their educational systems. Through these programs, students should be able to learn about science and scientific thinking from a young age. In recent years, the importance of this aspect has been increasingly recognized in our country, and gains related to science have been incorporated into the curriculum. In the Social Studies curriculum, such gains were added between grades 4 and 7 following the 2004 revision. Class teachers responsible for implementing the curriculum face difficulties primarily stemming from family-related issues. These issues include parents not valuing this aspect, family pressure, religious and political views, lack of awareness, superstitions, low socioeconomic status, and reluctance to allow participation in extracurricular activities. Kılıç (2011) found in his study that there was a significant difference between the educational levels of parents and the scores of their children in scientific creativity tests. Accordingly, children of parents with a university degree obtained higher scores compared to those whose parents had a high school or lower educational level. There was a

positive relationship between the educational level of parents and the scores of students in scientific creativity tests.

Other challenges faced by students include certain habits, poor academic performance, incorrect preconceptions, and lack of enthusiasm, as well as the inadequacy of sample activities in the program. This finding is consistent with previous research. For instance, Baysal, Kaya, and Üçüncü (2013) found a low but significant difference between students' scientific creativity levels and their academic achievements. Students with high scientific creativity abilities also had higher academic achievements.

It is evident that, with the exception of one teacher, class teachers tend to attribute their problems to external factors. They do not consider evaluating themselves in terms of desire, knowledge, and skills. The effective transmission of scientificness as a value to future generations is directly related to the competence of the teachers who provide this education. When societies undertake comprehensive reforms or innovations, they must prepare their staff in a way that will lead them to the target. Class teachers, who are the guides in instilling values, must be effective and meticulous in imparting various values, including scientificity, to bring forth generations of the desired quality. To achieve this transfer, teachers need to have the necessary knowledge, competence, and ideal values related to value judgments and values education. Otherwise, the desired goals cannot be achieved.

5. Recommendations

Teachers can minimize the difficulties they encounter by adopting a problem-solving approach and benefiting from various programs such as seminars, symposiums, and conferences related to values education.

To enable class teachers to raise good individuals throughout their professional careers, "values education" courses should be included in the undergraduate programs that train class teachers, and practical learning environments should be provided.

The National Education Social Studies Program should include more examples of practical applications related to the education of the value of scientificity. This will guide teachers in transmitting this value.

Students should be exposed to rich learning environments where formal or informal activities contributing to the development of scientificity, such as science museums, nature trips, observation activities, and experiments, can be conducted.

In-depth research should be conducted on the practices and fields of imparting scientific thinking skills to children in countries that perform well in exams such as PISA and TIMSS.

In Finland, the fact that teachers hold at least a master's degree has a significant impact on the success of Finnish students in PISA exams. Based on this result, it can be beneficial to popularize postgraduate programs related to teacher training fields in our country, and teacher candidates should be encouraged to pursue postgraduate degrees to enhance their research skills before starting their duties, thereby increasing the quality of education.

The value of scientificness is crucial not only for Social Studies but also for other subjects. Programs that combine scientificness with different subjects can be designed.

Not all values, including the value of scientificity, can be expected to be learned only in schools. Therefore, schools should be open to collaboration with parents, and parental education on values should be incorporated.

Research can be conducted to assess the knowledge level, scientific thinking abilities, and teaching competencies of teachers, which are the essential factors in imparting the value of scientificness effectively.

Acknowledgements

This study was supported by Aydın Adnan Menderes University Commission of Scientific Research Projects with project number of EĞF-17016

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