

## Opinions of Graduate Students Regarding Scientific Value

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### Abstract

Values play an important role in the regular functioning of society with its economic, social and cultural aspects. Scientific value; it is one of the most effective values in the process of acquiring knowledge and skills such as scientific thinking, critical thinking, problem solving and distinguishing superstitions from facts. Qualitative research method was used in this research, which aims to determine the views of graduate education students about the value of being scientific. The study group of the study consisted of 38 postgraduate students at the non-thesis master's, thesis master's and doctorate levels of educational sciences and field education programs at Dicle University. Interviews were held to determine the opinions and suggestions of graduate students about the value of being scientific. Descriptive analysis technique was adopted in the analysis of the data. Research findings indicate that the students understand the value of being scientific as being objective, being provable, conforming to ethical principles and being obtained by scientific methods. Regarding the qualifications to be possessed regarding the scientific value, it is understood that the students mostly emphasize to act in accordance with scientific research methods and publication ethics. Considering the views of graduate students about the effective acquisition of scientific value, the results show that they mostly recommend "practice based learning".

**Keywords:** Scientific Value, Graduate Education, Interview

**DOI:** 10.29329/ijpe.2024.657.3

**Submitted:** 18/04/2023

**Accepted:** 15/03/2024

**Published:** 05/04/2024

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## INTRODUCTION

Values can affect human behavior directly or indirectly in many ways in social life. In the regular functioning of society with its economic, social and cultural aspects, values play an important role. In this respect, values are the study field of many social science disciplines such as psychology, sociology and educational sciences and can be defined by considering them from different perspectives.

The concept of value is defined in the current Dictionary of the Turkish Language Association (2023), as "an abstract measure that helps to determine the importance of something, the value that something is worth", Halstead and Taylor (2000) defined it as "the principles and core beliefs that generally guide behavior, and the standards by which actions are judged as good or desirable".

Values are regarded as criteria in determining the goals and ideals of people in their lives, shaping their attitudes, evaluating various events and people, and exhibiting their behaviors. For instance, a person who adopts the value of responsibility may aim to be a person who fulfills his/her responsibilities while determining what kind of person he/she will be in life. (Demirhan İřcan, 2019).

It is possible to predict the attitudes and behaviors of individuals and groups by obtaining information about their cultural values, and their attitudes and behaviors. In addition, it is difficult to make sense of the problems that individuals face in social life and evaluate them without taking into account the correct and reliable information about the values they adopt (Aydın & Akyol Grler, 2012:4).

In the literature, several research studies pointed out some classifications of values. Spranger (1928) carried out one of the first studies on the classification of values using the value test in psychology. In this classification, values are comprised of aesthetic, theoretical (or scientific/experimental), economic, political, social and religious values (Gngr, 1993). In his study, Spranger expressed scientific values as "giving importance to the discovery of the truth, acquiring and systematizing knowledge, exhibiting a cognitive attitude, reasoning, empirical, critical and rational thinking, and being intellectual" (Spranger, 1928; as cited in Kaęan, 2019). Inspired by Spranger's research, Allport, Vernon & Lindzey (1960) divided values into six classes: aesthetic, economic, social, political, religious and scientific. In scientific values, rational thinking, observation, criticism and research have precedence (řimřir & Dilmaę, 2020).

Scientific value includes critical, active, independent, impartial, creative thinking, acting with reason, being open to new ideas, supporting ideas, constantly considering reasons and evidence, questioning, producing solutions, searching the reasons and evidences supporting the asserted claims, making judgments until sufficient evidence is found; it also involves items such as doubting, drawing conclusions, and applying to similar cases (Mindivanlı, Kęk ve Aktař, 2012). Scientific value is one of the most important values of making students acquire skills like; scientific thinking, critical thinking, creative thinking, problem solving, questioning, distinguishing superstitions from facts, increasing from imitation to research and examination level, and the desire to learn new things (Gcen, 2014). Individuals having the concept of scientific value try to find solutions to the problems they encounter with rational, empirical, questioning and research-based techniques (Osmanoęlu, 2019). Through the scientific value that predicts individuals exhibiting behaviors based on science, it is aimed to raise open and forward-thinking individuals who research, question, solve problems, and produce (Kasa, 2015).

Economic, social and cultural changes and developments towards becoming an information society increase the expectation of more qualified service from universities, which are regarded as leading institutions (Arslan, 2009). Universities, fulfilling the duties of education, research and community service are expected to have scientific, humanitarian and ethical values. Universities generate knowledge through research in order to train the qualified manpower needed by the country, to solve social problems and to contribute to science. Scientific values such as being scientific, valuing

knowledge, and self-sacrifice for knowledge production take place in the organizational culture of universities that fulfill the above mentioned functions (Erdem, 2003). In this sense, postgraduate education programs carried out through institutes within the university also have important objectives.

Postgraduate education is important in terms of training academic staff, carrying out scientific activities and raising a qualified workforce that will contribute to social development with high-level skills (Koçak and Yusuf Arslan, 2020). The main aim of postgraduate education is to train professionals who are qualified in their field within a few years (Rosovsky, 2004).

When the studies in the literature are analyzed, it is seen that a variety of research studies have been conducted in the field of the scientific value. It is found out that these studies are conducted with secondary school students (Katılmış, Ekşi & Öztürk, 2010; Sözcü, 2015; Sözcü & Aydınöz, 2018; Osmanoğlu, 2019; Durmaz, 2019; Çelebi, 2020;), teacher candidates (Çal & Demirkaya, 2018; Er Türküresin, 2018), university students (Demirutku & Güngör, 2021) and working adults (Demirutku & Güngör, 2017) in terms of the samples and study groups. In the study conducted by Ergin, (2021), the perceptions of Social Studies teachers and middle school 6th grade students on the value of being scientific and Social Studies teachers' views on the value of being scientific were determined. In addition, both in the Religious Culture and Moral Knowledge course (Gücen, 2014), and several other studies in which there are findings related to values and values education in general also refer to the value of being scientific in general (Erdem, 2003; Aslan, 2009; Mindivanlı, Küçük & Aktaş, 2012; Beldağ, 2012; Sönmez, 2014; Arabacı & Gündüzalp, 2014) However, in the literature review, no research has been found that directly examines the views of postgraduate students on the value of being scientific.

Globalization encourages the transformation of the perception and understanding of education and the general philosophy of education systems, the existing approaches and practices of the system in raising human beings (Doğan, 2011). In time, scientific studies have become the most important element of competitiveness globally, especially in developed countries. In this context, in schools there is a need to make the children and young people at all educational levels, especially starting from a young age acquire the value of being scientific. Parallel to these developments, one of the important elements of the education process is providing students with the scientific values (Sözcü & Aydınöz, 2018).

Graduate students, who are expected to be an expert in their subjects and future academicians in their own fields, should have knowledge and skills such as critical thinking, questioning, reaching generalizations, and scientific values. In this sense, it is important to evaluate the views of students who have experienced the postgraduate education process about science, the nature of science and the value of being scientific. It is considered that this study, which was carried out with non-thesis master's, master's and doctoral students with thesis, reflects different views on the value of being scientific in various aspects. It is expected that the research will contribute to the literature on values education and scientific value in postgraduate education in line with the stated opinions and suggestions.

### **Purpose of the Research**

The purpose of this research is to determine the views of postgraduate students about the value of being scientific. For this purpose, the following research questions were answered.

1. What do graduate education students understand from the value of being scientific?

2. What are the behaviors that postgraduate students describe as contrary to the scientific value?
3. What are the qualifications that postgraduate students should have regarding the scientific value?
4. What are the suggestions for postgraduate students to gain scientific value effectively?

## **METHOD**

Qualitative research method was used in this study in which the views of postgraduate students about the value of being scientific were examined. In the qualitative research method, researchers explore how people interpret their experiences, how they structure their worlds, and what meanings they ascribe to their experiences. This is a case of understanding people's experiences with specific questions and requires qualitative patterning (Merriam, 2009). In qualitative research, data is usually obtained from field, and in such a study, the researcher spends time in the environment in which he/she studies. In research, comprehensive field notes are collected through observations, interviews and document reviews (Patton, 2002). The main purpose of qualitative research is to capture the perspectives of the participants and the findings and opinions obtained as a result of qualitative research completely reflect the real world of the participants, independent of the values, meanings and prejudices of the researchers (Yin, 2011). In this research, face-to-face interviews were conducted in postgraduate students' study environment to determine the perspectives and opinions of them on the subject.

### **Research Design**

In this study, phenomenological research was used. Phenomenology aims to gain a deeper understanding of our daily experiences (Patton, 2002). Phenomenology studies provide in-depth data in the literature in terms of both the definition and dimensions of the phenomenon focused on, and the meanings that the participants experienced and created with this phenomenon (Aydın, 2014). The stages followed in phenomenology research can be outlined as follows: In phenomenology, the phenomenon that the study is related to is determined. Data are collected from individuals who have experienced the phenomenon. Participants are asked questions about the phenomenon and what context or situations affect their experience with it (Creswell, 2007). In this research, it is aimed to determine the opinions and suggestions of the students who have experienced the value of being scientific in the postgraduate education process, within the framework of the research questions directed to them.

### **Participants**

The study group of this research consisted of 38 students in total. The participants are in either education sciences or field education graduate programs at Dicle University in the spring semester of the 2017-2018 academic year. They go on their education at the non-thesis master's, thesis master's and doctorate levels. In relation to the sampling strategy, maximum variation sampling and easily accessible case sampling, which are purposive sampling methods, were used in the research. Maximum diversity is achieved by identifying the diversity dimensions most relevant to the study and selecting people and environments that represent the best possible diversity in these dimensions (Maxwell, 2018). According to Seidman (2006), maximum diversity sampling provides the most effective strategy for selecting participants. In convenient sampling, a situation that is close and easy to access is selected.

This sampling method adds speed and practicality to the research (Yıldırım & Şimşek, 2018). In this research, the variety of graduate students from different programs ensures the maximum diversity, and as the students participate in the study from the same university provide easy accessibility. Personal characteristics of graduate students are shown in Table 1.

**Table 1: Personal Characteristics of Graduate Students**

<b>Characteristics of Students</b>	<b>f</b>
<b>Gender</b>	
Female	18
Male	20
<b>Job</b>	
Teacher	27
Research assistant	3
Teaching assistant	2
Other	6
<b>Graduate Education Level</b>	
Non-thesis master's degree	6
Thesis master's degree	21
Doctorate	11
<b>Graduate Education Term</b>	
Course period	27
Thesis period	11
<b>Types of Graduate Education</b>	
Curriculum and Instruction (Non-Thesis MA)	5
Curriculum and Instruction (Thesis MA)	6
Curriculum and Instruction (Phd)	12
Educational Leadership (Non-Thesis MA)	1
Educational Leadership (Thesis MA)	1
Educational Leadership (Phd)	3
Visual Arts Education (Thesis MA)	3
Mathematic Education (Thesis MA.)	2
Classroom Management (Thesis MA)	2
History Education (Thesis MA)	1
Science Education (Thesis MA)	1
Physics Education (Thesis MA)	1

According to the Table 1, 18 female and 20 male graduate students participated in the study. The majority of the participants are teachers. In the other group, there were six students, five of whom stated that they were not working and one of them was a civil servant. 27 of the participants are in the course period and 11 of them are in the thesis period. All of the students in the thesis period are registered to the Master's and Doctorate programs with thesis. Slightly more than half of the participants in the research consisted of non-thesis master's, thesis master's and doctorate students who continue to education programs and teaching department.

### **Interview Form and Data Collection Process**

In this study, interview technique was employed to collect data. Interview is a widely used data collection tool in qualitative research. Researchers have the opportunity to capture the perspectives of the participants by interviewing. Interviews can provide useful information in finding response to the research questions, but they need to be performed with care, on-site and through detailed processes. This process involves developing a complete interview form to gather information and turning it into a good practice (Creswell, 2017). Expert opinion was obtained from six faculty members working in the field of educational sciences for the validity of the draft interview questions prepared in this study. In line with the opinions and suggestions received, the interview questions were revised and structured. The questions in the interview form were asked to four graduate students in education science who were out of the scope of the research, and as a result of the feedback from the students, it was decided that the questions were clear and understandable.

The following questions take place in the interview:

- 1 - Explain what you understand by the term “scientific value”?
- 2 - What are the behaviors that you describe as contrary to the scientific value? Explain.

- 3 - What are the qualifications that graduate students should have regarding scientific value? Explain.
- 4 - What is your suggestion for effective acquisition of scientific value in graduate education?

In the data collection process, semi-structured interview technique was used, and when the requirements were met, focus group interviews were conducted. In addition, face to face interviews were conducted with some of the participants. All of the graduate students in the study voluntarily participated in the research. The answers stated by the graduate students were transferred to the forms in written form during the interviews parallel to participants' responses. The researcher also took notes on the subject during the interview process. The opinions expressed by the students in the interviews were confirmed in order to ensure reliability. The interviews were held between 30.04.2018-18.05.2018 and lasted approximately 25 - 35 minutes.

### **Analysis of Data**

Descriptive analysis technique was used in the analysis of the data obtained from the interview. Generally, descriptive analysis is used in the processing of data that does not require detailed separation on the qualitative data set (Baltacı, 2019). In the descriptive analysis technique, the data can be organized according to the themes revealed by the research questions, or it can be presented by considering the questions in the interview. In descriptive analysis, direct quotations are frequently used to reflect the views of the individuals interviewed or observed in a direct way. In this analysis technique, it is aimed to present the findings to the readers in an organized and interpreted form (Yıldırım & Şimşek, 2018). In this research, a thematic framework was created with the data obtained from the fuels given to the interview questions.

Expressions reflecting the views of graduate students were frequently quoted directly. In the quotations made, instead of the names of the students, the student numbers given to them and the graduate education programs they continue are indicated; Coding was made with abbreviations such as (Ö 25, MS without Thesis), (Ö 13, MS with Thesis), (Ö 17, PhD). The answers to the interview questions were analyzed by two different experts. As a result of the coding made by the experts, the codes that create "agreement" and "disagreement" were determined. The reliability formula proposed by Miles & Huberman (1994) is based on the reliability of the coding. In this study, 61 "agreement" and 6 "disagreement" were determined.  $\text{Reliability} = \frac{\text{Agreement}}{\text{Agreement} + \text{Disagreement}}$ . According to this formula,  $\text{reliability} = \frac{61}{61+6} = 91\%$ . In line with this calculation, it was concluded that the reliability of the research was acceptable.

## **FINDINGS**

In this section, the findings obtained from the participants who responded the interview questions about the scientific value in line with the purpose of the research are presented.

### **Findings Regarding What Students Understand by Scientific Value**

The opinions expressed about the first question are shown in Table 2.

**Table 2: What Students Understand from the Value of Science**

Sub Themes	f
Being objective	17
Being provable	11
Compliance with ethical principles	11
Obtained by scientific methods	9
Distinguishing superstitions from facts	6
Creating solutions/contributing	6
Being logical	5
Revealing the new	4
Being open to criticism	4
Being testable	4
Being original	4
Being free from prejudices	3
Obtained by inquiry	3
Being systematic	3
Being repeatable	2
Reflecting the truth	2
Alternative thinking	1
Creative thinking	1
Being transparent	1

When Table 2 is examined, "being objective" is the most frequently expressed sub-theme regarding what graduate education students understand from the value of being scientific. Thereafter this sub-theme, "being provable", "compliance with ethical principles", "obtained by scientific methods" and "separating superstitions from facts" come successively.

Some of the opinions expressed about the sub-theme of "being objective/objective" are as follows: *"Scientific value is to produce objective, observable and demonstrable knowledge while doing science... To be objective and scientific both in the process, method and results of research (Ö 2, Phd)"*. *"I understand it as an individual's behavior that conforms to the criteria required by science. The first feature that I can express as a scientific value is objectivity. Doing research impartially means that you shouldn't include your personal feelings and thoughts in the research in any way (Ö 17, Phd)"*.

Here are some views on "being provable": *"For a study to be scientific, it must be provable, original, and responsive to the needs of society (Ö 29, MA with thesis)"*. *"Scientific values are facts that can be proven experimentally (Ö 34, Phd)"*.

An example statement regarding "compliance with ethical principles" is as follows: *"I perceive the value of being scientific as acting in accordance with ethical principles in academic studies and presenting research results in an impartial and honest manner (Ö 2, Phd)"*.

Opinions about "obtained by scientific methods" are expressed as follows: *"By the value of being scientific, I understand that scientific methods should be used, being objective and revealing what it is while doing a research. The scientific method means making observation, interview, experiment, etc. in order to gather information (Ö 19, MA with thesis)"*. *"Anything can be the subject of research. However, it is necessary that the methods used in this research comply with scientific criteria and the results are evaluated accordingly in terms of the scientific value of that research (Ö 28, MA with Thesis)"*.

The followings are students' views on "distinguishing superstitions from facts": *"I understand it as being free from superstitions and irrationality (Ö 19, MA with thesis)"*. *"Critical thinking is the most important value that must be adopted in order to protect ourselves and our values against unscientific and often superstitious thoughts. (Ö 20, MA with thesis)"*. *"Be free from non-scientific, superstitions and personal thoughts (Ö 35, MA with thesis)"*.

Some of the opinions about “producing solutions/contributing” are stated below: “Being scientific is to reach the right result with the right questions, the right methods and be beneficial to humanity. (Ö 8, MA with thesis)”. “When I hear the term scientific value, I think of being useful to society. Because science always means taking humanity one step further, therefore, when it comes to scientific value, it comes to my mind to be able to sharply distinguish between right and wrong and to work on behalf of humanity in this direction. (Ö 18, MA with thesis)”.

An example statement about “being original” is as: “Scientific value means that a research is original and far from similarity of other researches. (Ö 23, Phd)”. The following is a statement expressing a student's view on "reflecting the truth". “Scientific value aims to be away from all types of research bias and prejudice and to completely reflect the truth and not to allow ethical violations. Because, a knowledge is scientific as much as it reflects the truth and is away from personal opinions” (Ö 16, MA with thesis)”.

### Findings Regarding the Behaviors that Students Evaluate as Contrary to Scientific Values

The opinions of the students regarding the second question are presented in Table 3.

**Table 3: Behaviors Evaluated as Contrary to Scientific Values**

Sub-Themes	f
Plagiarism	26
Hiding/distorting real data	17
Non-compliance with citation rules	9
Impartiality/bias	8
Obtaining imprecise data	7
Not being original	6
Knowledge not obtained through scientific means	5
Making up	5
Unfair authorship	5
Re-publication	4
Being biased	4
Carelessness in ethical issues	4
Inability to get rid of dogmatic thoughts	4
Superstitions and mythicism	4
Not behaving honestly	4
Placing ideologies before science	3
Studies just for academic promotion	3
Favoritism	1
Being away from critical thinking	1

When Table 3 is examined, "plagiarism" is stated as one of the leading behaviors that the graduate education students describe as contrary to the scientific value. This was followed by the sub-themes of "hide/distort the real data", "non-compliance with the citation rules", "impartiality/bias" and "getting sloppy data" according to the frequency of expression.

Some opinions about the sub-theme "plagiarism" were expressed as follows: “I think in a study plagiarism is one of the most important issues that one need to avoid (Ö 15, Phd)”. “Benefiting from someone else’s study but not giving any citation or citing not correctly that study means not giving due respect to the effort (Ö 24, Phd)”. “Plagiarism is the first thing that comes to my mind when it comes to contradicting the scientific value. This behavior is the academic side of stealing (Ö 37, MA without Thesis)”.

Followings are some opinions regarding “Hiding/distorting real data”: “When a study is contrary to scientific value, the data obtained do not reflect the real results and the data is manipulated with unethical methods. (Ö 6, MA with Thesis)”. “In a scientific study, not collecting the

*data in a proper way or manipulating the data are contrary to the scientific value (Ö 18, MA with Thesis)”.*

An instance about “Non-compliance with citation rules” is: *“The problems related to the sources are that the sources are not cited clearly in the researches, and the expressions cited in the text are not taken in the signified sources (Ö 8, Phd)”.*

The statements below reflect the ideas of participants expressing “Obtaining imprecise data”: *“Failure to collect the data properly during the data collection phase in a scientific study is against the scientific value. (Ö 18, MA with Thesis)”.* *“Within the scope of the project, I went to schools and met teachers who were expected to fill out the questionnaires. Their manners towards that process showed that they are really far away from being scientific. Some of my fellow teachers seemed to be playing the lottery rather than filling out questionnaires (Ö 25, MA without Thesis)”.*

Followings are the statements reflecting “Knowledge not obtained through scientific means”: *“This is expressing an opinion without any basis. It is to create a work by making cut, paste and copy without effort (Ö 33, MA without Thesis)”.* An idea about “Not being original” is: *“Being similar to someone else's subject in the scientific study process reduces the scientific value of the study (Ö 23, Phd)”.* “Unfair authorship” is expressed in the following statement: *“This is to add one's own name to academic studies by relying on his/her position and authority, even though she/he did not make any effort (Ö 23, Phd)”.*

An example regarding “Superstitions and mythicism” is: *“The most contradictory situation we encounter in society regarding the value of being scientific is the belief in superstitions. In addition to this, mythicism is also contrary to scientific value (Ö 34, MA with thesis)”.* “Being honest” is expressed as: *“Scientific value undoubtedly requires being honest. For example, showing a work that has not been done, showing unreached sources as if they have been reached ... are the most common practices against scientific value (Ö 3, Phd)”.*

Following statements reflect the ideas about “Studies just for academic promotion”: *“I think that the studies carried out with the aim of just promoting to a higher position are against the scientific value (Ö 3, Phd)”.* *“Studies that are shown as if they were done only to obtain statu, that is also against the value of being scientific (Ö 8, Phd)”.* About “Favoritism” a participant uttered that: *“Particularly, acts showing favoritism harm science (Ö 2, Phd)”.* Followings are the opinions about “Being away from critical thinking”: *“Taking positions without critical thinking are the most unscientific way. Because being scientific requires critical thinking, which gives the ability to think about all sides of a coin. (Ö 3, Phd)”.*

### **Findings Concerning the Qualifications that Students Should Have Related to Scientific Value**

The opinions of the students about the third question are presented in Table 4.

**Table 4: Qualifications that Students Should Have Related to Scientific Value**

<b>Sub-Themes</b>	
Behaving in accordance with scientific research methods and publication ethics (avoiding plagiarism, distortion, etc.)	21
Being honest	11
Being objective	10
Being inquisitive	9
Being equipped with the necessary scientific research methods	7
Prioring the scientific value in research	6
Having a critical view	6
Willingness to make research	6
Learning scientific research methods in a practice based way	4
Internalizing the scientific value	3
Being original	3

Citing the sources properly	3
Being open to improvement	3
Being creative	2
Being brave	2
Being altruistic	1

When Table 4 is examined, the most frequently expressed sub-theme is "Behaving in accordance with scientific research methods and publication ethics" regarding the qualifications that students should have for the value of being scientific. According to the frequency, this sub-theme was followed by the sub-themes "being honest", "being objective", "being inquisitive" and "having experience in scientific research methods".

Some of the opinions considering "Scientific research methods and acting in accordance with publication ethics (avoiding plagiarism, distortion, etc.)" are expressed as follows: *"First of all, students should be aware of scientific ethics violations such as plagiarism, distortion, forgery, republishing, and slicing (Ö 12, MA with thesis)". "The most important quality to be possessed considering scientific value is to act in accordance with the rules of publication ethics. .... Complying with the rules of publication ethics is the most important qualification that a graduate student should have regarding the value of being scientific (Ö 18, MA with thesis)".*

Followings are the statements reflecting "Being honest": *"I think graduate students should first be honest in their academic studies (Ö 2, Phd)". "It is important for graduate students who are academic candidates to be open to innovation, honest and respectful researchers (Ö 29, MA with Thesis)".*

"Being inquisitive" is expressed as: *"Graduate students should be inquisitive. He/she should know what he/she is doing and why. He/she should question the events in depth. (Ö 25, MA without Thesis)". "Regarding being scientific graduate students should have the skills of questioning and reasoning. (Ö 26, MA without Thesis)".*

Some opinions about "Being objective" are: *"The researcher should not manipulate the study, and should be impartial and objective (Ö 4, MA with thesis)". "Researcher needs to perform objectively (Ö 17, MA with thesis)". "Lisansüstü öğrencilerinin özellikle tüm ideolojilerden uzak, nesnel düşünebilen ve bilimsellik değerine önem veren kişiler olması gerekir (Ö 32, Phd)"*

Participants expressing their ideas about the qualification of a researcher uttered regarding "Be equipped with the necessary scientific research methods" *"First of all, graduate students should be equipped with theoretical and methodological knowledge about scientific research methods (Ö 3, Phd)". "A graduate student should be able to carry out a study alone. He/she should be able to criticize a research and evaluate the lacking and strong parts of that study. Moreover, he/she must be able to determine the quality of a study (Ö 22, Phd)". "A graduate student should know research methods and be able to assess the research results with the scientific method criteria (Ö 28, MA with thesis)".*

Following is a statement reflecting "Prioritizing the scientific value in research": *"Graduate students go on their education purposely and willingly to become academicians or to improve their knowledge, views and perceptions in their fields... From then on they prioritize being scientific, and therefore the value of being scientific in their studies and education (Ö 7, Phd)".*

Some of the participants mentioned about "Having a critical view" that: *"They (graduated students) need to be planned, ... try to establish cause-effect relationships, try to establish hypotheses, not accept all information the way it is, but they must think critically and question the facts they have (Ö 35, MA with thesis)". "First, the graduate student must be able to think critically.(Ö37,MAwithout thesis)".*

Participants who expressed their ideas about “Willingness to make research” said that “*First of all, a graduate student must be curious and willing to question and search the information (Ö 6, MA with thesis)*”. “*Reading and researching should be a daily routine of graduate students (Ö 20, MA with thesis)*”.

“Learning scientific research methods in a practice based way” is expressed as following: “*Graduate students must do academic studies. With the help and leadership of the academicians, graduate students should write articles, do scientific research, and participate in congresses and symposiums (Ö 13, MA with thesis)*”. “*They (graduate students) should focus on reading especially thesis, article, book, paper etc. related to their fields. Furthermore, they should also be productive in their field (Ö 37, MA without thesis)*”.

Below are the ideas regarding “Citing the sources properly”: “*He/She should state the sources he/she used in his/her studies exactly in the bibliography (Ö 6, MA with thesis)*”. “*First of all, all sources that graduate students have used and benefited in their studies should be cited properly (Ö 24, MA with thesis)*”.

The statements below reflect the ideas of participants expressing “Being open to improvement”: “*In my opinion, he should follow not only Turkish publications, but also academic studies published around the world and improve himself. Only in this way can students evaluate the events from a scientific perspective (Ö 6, MA with thesis)*”. Considering “Being brave” the participants uttered that: “*They must be willing to reveal the truth. They must be brave enough to put the truth above their own beliefs (Ö 30, Phd)*”. “Being altruistic” is another sub-theme expressed as: “*They must be self-sacrificing to reach the truth (Ö 30, Phd)*”.

### **Findings Concerning Suggestions for Making Graduate Students Gain the Value of Being Scientific Effectively**

The opinions expressed by the students about the fourth question are presented in Table 5.

**Table 5: Suggestion for Making Graduate Students Gain the Value of Being Scientific Effectively**

<b>Sub-Themes</b>	<b>f</b>
Practice based learning	13
First of all, academics should adopt this value	10
Academicians need to be a guide in this regard	8
Participation to congress and symposium should encouraged be	7
Various scientific studies should be carried out	6
Science ethics course should be included in the program	5
This must start from undergraduate education	5
Courses related to the subject should be compulsory	4
Courses on this subject should be increased	4
Evaluation should be based on scientific principles	4
Being scientific should be a topic for all courses	3
Panels and conferences related to the subject should be organized	2
Being scientific should be brought together with all other values	2
	1

When the suggestions of the students regarding the effective acquisition of scientific value are examined in Table 5, "Practice-based learning" is the most mentioned sub-theme. This was followed by the sub-themes of " First academics should adopt this value", "Academicians need be a guide in this regard", " Participation to congress and symposium should be encouraged" and "Various scientific studies should be done". Some of the views on “*practice-based learning*” are as follows: “*I think that on spot studies in graduate education will be more effective. I believe in the permanence of learning by doing, therefore I believe that the value of being scientific can be gained through practice based education (Ö 25, MA without thesis)*”. “*As in every period of education, in the graduate period students can internalize the knowledge by experiencing and practicing (Ö 34, Phd)*”.

Here are some examples of statements about the view that "first of all, academics should have adopted this value": *"Graduate education is the most necessary educational step to gain scientific value. Academicians who will lead the education should also adopt this value so that this awareness can be well established in graduate education (Ö 4, MA with thesis)". "As in all matters, the individual is inclined to exhibit the behaviors of people he/she respects and cares about. The most correct behavior that lecturers can apply in this regard is to show that they have this value. When an academician give credit to those who contribute to science and praise their efforts in his/her speeches and articles, It will be a beneficial example for the students (Ö 11, MA with thesis)".*

The views on "Academics should be a guide in this matter" are as follows: *"Graduate students and professors should definitely make research, and professors should guide students and help them gain an academic perspective (Ö 6, MA with thesis)". "First of all, advisors in scientific studies should be good examples to them, inform them about scientific activities, and encourage them in scientific studies (Ö 29, MA with thesis)".*

"Participation to congress and symposium should be encouraged" is expressed as: *"Students may be urged to participate in symposiums or to cooperate with their advisors. This can contribute to their qualification (Ö 28, MA with thesis)". "Advisor professors should direct the student to meetings where events such as congresses and symposiums are held. This will be effective in teaching scientific values (Ö 29, MA with thesis)".*

Instances regarding "Various scientific studies should be carried out" is described as: *"Since carrying out several scientific studies throughout the graduate education will be effective in internalization of the value of being scientific, students need to participate in producing academic studies actively (Ö 3, Phd)". "I think that the only way of making students adopt the value of being scientific in graduate education is to motivate them to do various scientific studies during their education (Ö 37, MA without thesis)".*

The statements below reflect the ideas of participants expressing "Science ethics course should be included in the program": *"First of all, a science ethics course should be included in the program. In the content of this course, it should be taught why it is necessary to gain the value of scientific ethics (Ö 34, Phd)". "Graduate students should be taught scientific ethics and extent it to their lives (Ö 35, MA with thesis)". Related to "This must start from undergraduate education" one of the participants uttered that: "First of all, this subject should be covered in detail beginning from the first lesson of undergraduate education classes so that all students who head towards graduate education have this understanding from the very first day (Ö 7, Phd)".*

The following is an idea regarding "Courses related to the subject should be compulsory": *"It would be purely imaginary to expect such an important value to be acquired later in graduate school. These courses needs to be compulsory through some programs (Ö 18, MA with thesis)". A suggestion considering "Courses on this subject should be increased" is that: "Courses on scientific value and ethics should be increased in undergraduate and graduate studies (Ö 14, MA with thesis)". Another suggestion regarding "Being scientific should be a topic for all courses" is that: "Emphasis should be placed on being scientific in all courses in graduate education, without exception (Ö 7, Phd)".*

An idea expressing the importance of "Being scientific should be brought together with all other values" is expressed as: *"Students can not get the idea of scientific value on their own. Before that, there are basic values that need to be acquired. Generally; without values such as personal rights, justice and honesty, trying to acquire the value of being scientific will be a futile effort (Ö 9, Phd)".*

## **DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

Students who continue their graduate education express the characteristics of being scientific as being objective, being provable, conforming to ethical principles and obtained by scientific

methods. In addition, it is understood that aspects such as producing solutions, being rational, revealing the new and being open to criticism are also uttered for the value of being scientific. In the study conducted by Arabacı and Gündüzalp (2014), they examined the statements of 36 universities regarding “value” on their web pages. They concluded that they directly included "being scientific" as a value and that the expressions regarding value are "rationalism" and "objectivity" within the scope of this theme. Findings of current study is consistent with the above mentioned study regarding the statements of value in universities web pages. Although not directly related, the findings in a way overlap with the research findings of Çal and Demirkaya (2018). In their metaphor study whose participants were pre-service teachers, the themes of "being scientific by being objective" and "being scientific by being logical" obtained as the value of being scientific. Er Türküresin (2018) carried out a qualitative study the title of which is “Improving the perceptions regarding the value of being scientific through character education program” with teacher candidates. The findings of that study which is "evidence use" and "ethics" to be scientific aligned with the current study. In another study conducted by Ergin (2021) with the participation of Social Studies Teachers for the value of being scientific, the results as "proven" and "realistic" in the categorical distribution of the metaphors support the present research findings. In their work, Demirutku and Güngör (2021) determined the values of creativity, curiosity, skepticism, open-mindedness, rationality, objectivity, commonality, scientific ethics and consistency as scientific values. It can be said that rationality and objectivity coincide with the research findings of this study.

Sub-themes such as plagiarism and hiding/distorting real data were the characteristics that the students described particularly as contrary to the value of being scientific. In addition to these, it is noticed that non-compliance with the citation rules, being unbiased/biased, sloppy data collection, being not original, and information not obtained through scientific means are listed as the main features that the students describe as contrary to the value of being scientific. In this context, according to the opinions of postgraduate students on this issue, unethical behaviors in science (TÜBA, 2002) are items such as plagiarism, hiding/distorting real data, obtaining sloppy data, fabrication, unfair authorship and republishing. In addition, they perceive actions contrary to scientific research and publication ethics (YÖK, 2022) as actions contrary to the value of being scientific as well.

It is understood that the students mostly emphasize scientific research methods and acting in accordance with publication ethics (staying away from plagiarism, distortion etc.) as the sub-themes of being scientific. From this point of view, it can be concluded that students perceive knowing research methods and acting in accordance with publication ethics as the main qualifications that need to be possessed with scientific value. Furthermore, it can be said that they perceive traits such as being honest, being objective, being inquisitive, and being equipped in scientific research methods courses as necessary qualities for scientific value. In addition, it is found out that the other qualities that students should have regarding the scientific value are to have a critical point of view, to learn practice based research methods, to internalize the value of being scientific, to be original, to be open to development and to be creative.

Considering the views of postgraduate students about the effective acquisition of scientific value, it is understood that they mostly propose "practice based learning". Therefore, it can be inferred that the students think the value of being scientific will be gained more effectively with an approach which adopts doing and experiencing. Besides, the suggestions expressed by the students as "congress and symposium participation should be ensured" and "many scientific studies should be done" in order to gain the scientific value effectively can be evaluated in this sense within the framework of practice-based learning. In the research conducted by Yazar (2020), participants recommend “practical courses” and “encouragement to academic activities” for a qualified graduate education. It can be figured out that these results support the current research findings. Participants also suggested that in order to gain an effective scientific value, academics should adopt these values too and be a guide in this regard. In this context, it can be said that the students are of the opinion that primarily the academicians should internalize the value of being scientific and be a guide for the students in this process of gaining them. The students made suggestions about the courses in the program in order to gain the value of being scientific effectively. And they expressed their opinions about the need for the

science ethics course in the programs, it should start from undergraduate education. The courses related to the subject should be compulsory and the number of courses related to this subject should be increased. The students also emphasized the suggestions that being scientific should be mentioned in all courses, furthermore panels and conferences should be organized on this subject, and that the value of being scientific should be gained together with all other scientific values.

Followings are some suggestions that have been developed within the framework of the findings obtained in this research:

- Courses such as scientific research and publication ethics, research ethics and science ethics should be included more in graduate education programs.
- In order to make graduate students gain the scientific value effectively in graduate education programs, courses such as scientific research and publication ethics, research ethics and science ethics should be carried out more practice based.
- Participation in congresses and symposiums should be encouraged more so that graduate students can internalize the value of being scientific.
- Knowledge and skills related to value of being scientific should be internalized starting from undergraduate education.
- Qualitative and quantitative research should be conducted with different working groups on this subject.

**Conflicts of Interest:** No conflict of interest has been declared by the author.

**Funding Details:** This research was not funded by any organization.

**CRedit Author Statement:** This is a single author article. The author accepts all the responsibility for introduction, method, data collection, data analysis, discussion and conclusion.

**Ethical Statement:** This research was conducted in accordance with ethical principles and rules. This article is an original article that has not been published anywhere before. Data of the respective research were collected in 2018. The participants voluntarily took part in this study. The participants were informed about the research topic and it was stated that they could withdraw from the research at any time.

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