

Article

Not peer-reviewed version

Adaptation of Artificial Intelligence to Everyday Life for a Sustainable World: A Comparative Analysis of Artificial Intelligence and Teacher Decision-Making

[Neslihan KARAKUŞ](#)^{*} and Kerim Gedik

Posted Date: 17 September 2024

doi: 10.20944/preprints202409.1339.v1

Keywords: Keywords: Sustainable world; artificial intelligence (AI); ethical dilemmas; teacher of ethics



Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Article

Adaptation of Artificial Intelligence to Everyday Life for a Sustainable World: A Comparative Analysis of Artificial Intelligence and Teacher Decision-Making

Neslihan Karakuş and Kerim Gedik *

Yıldız Technical University, Turkey; neslihanoksuz61@gmail.com

* Correspondence: kerimgedik07@gmail.com; Tel.: +9-0543-394-70-51

Abstract: The utilization of artificial intelligence in education can contribute to sustainable development goals in various ways. AI in education can effectively convey sustainability issues to students. Through simulations and virtual environments, learners can experience sustainable practices firsthand. On the other hand artificial intelligence can assist administrators and educators in making data-informed decisions. This allows for more effective shaping of educational policies. This study explores how teachers and artificial intelligence (AI) address ethical dilemmas in education, comparing their decisions and examining the influence of variables such as gender, years of service, and education level. A total of 141 teachers from public schools in Turkey participated, and their responses were compared to AI-generated decisions using Yin's nested multiple-case design. The scenarios were analyzed through five ethical frameworks: virtue ethics, deontological ethics, utilitarianism, social justice ethics, and situation ethics. Results showed that AI provided the same answer as the majority of teachers in six out of eight dilemmas but differed in two. AI favored a more analytical, result-oriented approach, while teachers emphasized empathy and rule adherence. Gender differences revealed that males leaned towards utilitarianism, while females favored social justice and situation ethics. Less experienced teachers preferred deontological and social justice ethics, while more experienced teachers leaned towards virtue ethics and utilitarianism. Elementary teachers emphasized virtue and social justice ethics, while middle and high school teachers favored deontological ethics and utilitarianism. The findings provide insights into ethical decision-making in education by highlighting the differences between solutions proposed by artificial intelligence and those offered by teachers. Additionally, they emphasize the importance of adapting artificial intelligence to everyday life to foster a sustainable world.

Keywords: sustainable world; artificial intelligence (AI); ethical dilemmas; teacher of ethics

1. Introduction

In recent years, the concept of sustainability has gained considerable attention in both academic literature and everyday life. The rapid growth of the global population, coupled with accelerated industrialization, has led to the excessive and uncontrolled utilization of natural resources. Sustainability has emerged as a proposed solution to this issue, aiming to promote more careful use of these resources and to minimize, or even eliminate, the damage inflicted on the environment.

Sustainability encompasses a holistic approach that includes environmental, social, and economic dimensions. Environmental sustainability focuses on the preservation of natural ecosystems and the efficient use of resources, while social sustainability seeks to promote justice and equity by considering the needs of communities. Economic sustainability, on the other hand, involves managing existing resources in a manner sufficient for future generations. In this context, individuals, communities, and governments can develop a more conscious and responsible lifestyle by embracing sustainable practices. Education plays a critical role in the adoption and dissemination of this philosophy. Through education, individuals should be taught the concept of sustainability, and

awareness should be raised accordingly. This way, not only can the preservation of existing natural resources be ensured, but it also becomes feasible to leave a more livable world for future generations.

In an era where technology and artificial intelligence are increasingly prevalent in every aspect of life, the integration of artificial intelligence into sustainability initiatives has become inevitable. With capabilities such as big data analysis, predictive modeling, and automation, artificial intelligence can significantly contribute to the more efficient use of resources and the development of sustainable solutions. Therefore, failing to incorporate artificial intelligence into sustainability efforts represents a neglect of the potential benefits in this field. In this context, leveraging the opportunities presented by artificial intelligence will be a critical step towards achieving a more sustainable future

Ethical dilemmas are situations in which individuals and organizations find it difficult to make a clear distinction between right and wrong, and these dilemmas require complex decisions by testing moral values [1] Many people in various professional groups face different ethical dilemmas in their professional lives [2]. One of these areas is education. It has been determined that teachers face professional ethical and legal problems in the areas of confidentiality, competence, administrator relations, and parent relations, student safety, and when they cannot solve these problems, they experience ethical dilemmas [3–5] According to [NO_PRINTED_FORM] [6], many of the ethical dilemmas in education are unsolvable as they do not have a clear answer; instead, these dilemmas should be managed.

With the advancement of technology, the use of artificial intelligence in education provides a new approach to managing ethical dilemmas (Öztürk, 2019) Productive artificial intelligence has the potential to support teachers in ethical dilemmas with advanced data analysis, deep learning, and the ability to understand natural language input like a human (Bozkurt, 2023) However, the extent to which these technologies can focus on ethical sensitivity and human values is debatable [9]. This study compares the responses of teachers and AI systems to ethical dilemmas in education and examines the impact of two different perspectives on ethical decision-making processes. By trying to understand how both teachers and AI systems behave in the face of ethical dilemmas, our research aims to provide a deeper understanding of ethical management in education.

1.1. Ethical Approaches

According to [10], ethics focuses on human actions and examines only moral actions. In addition, ethics, as one of the four main areas of philosophy (knowledge, being, and logic), has a special importance as it is directly related to human beings themselves (İyi & Tepe, 2019). There are two main approaches that stand out in the history of ethics:

1. The “utilitarianism approach” developed by Jeremy Bentham and John Stuart Mill states that being virtuous is possible through wisdom and measures the value of actions by the benefit they provide [11]
2. The “deontological approach to ethics” [12] by Kant, which focuses on the nature and purpose of the action, determines whether it is right or wrong, and determines with what intention to act and what action should be taken based on rules, not caring about the consequences.

As well as the main approaches, there are also modern approaches that have emerged in recent [12]. Examples of these approaches include “situation ethics,” which argues that the moral value of an action depends on the circumstances in which it is performed and that the same action can be evaluated as right or wrong in different situations; and the “justice ethics” approach developed by Rawls [13] which argues that the principles of justice should be determined by a hypothetical social contract created under fair and equal conditions.

In the light of this information, it should be said that there is no single correct ethical approach, but that there are various ethical approaches that have been prominent throughout history. The answers to ethical dilemmas may be closer to one of these approaches in the past than others, and these answers may represent that ethical approach.

Table 1. Approaches to Ethical Dilemmas.

Ethical Approach	Defenders	Years	Definitions
Deontology	Immanuel Kant	18. century	An ethical approach that argues that moral rules are universal and binding.
Utilitarianism	Jeremy Bentham, John Stuart Mill	18th - 19th century	An ethical approach aimed at ensuring the greatest happiness as a result of actions.
Virtue Ethics	Aristotle	B.C. 4th century	An ethical approach that emphasizes virtuous behavior and character development.
Ethics of Social Justice	John Rawls	20th century	An ethical approach that aims to protect the rights of the weakest individuals in society.
Situation Ethics	Joseph Fletcher	20th century	A flexible ethical approach that argues that moral decisions can change according to the situation.

1.2. Ethics of Artificial Intelligence

The concept of artificial intelligence (AI) emerged in the mid-20th century with Alan Turing’s question “Can machines think?” and was accepted as an official research field at the Dartmouth Conference in 1956. In the 1960s and 70s, expert systems and symbolic artificial intelligence models were focused on, and applications in various fields began to be developed [14]. In the 1980s and 90s, the development of artificial neural networks gave a new impetus to artificial intelligence research [15] In the 2000s, machine learning and deep learning techniques developed rapidly with big data and increasing computing power, and the use of artificial intelligence in education increased in this process [16]

While the development of artificial intelligence brings many features that provide convenience for humans, this rapid change in recent times also causes people to have concerns about the future (Öztürk 2019) One of the issues occupying a large place among these concerns is ethics. The people who create the ethical algorithm of artificial intelligence are humans. Artificial intelligence systems prepared by malicious people can cause people to be seen as too much, weak, inadequate, or unable to compete and can pose a threat to values such as love, respect, and cooperation [9,17] emphasizes the importance of legal regulations in the inclusion of AI in public life, while [9] argue that digitalization in education can lead to inequality and privacy problems [9] While [18] discuss the necessity of ethical evaluation of autonomous systems, Li et al. (2019) draw attention to the ethical issues of AI such as privacy violations and algorithmic biases (18,19) In addition, [20] discuss in detail the measures that can be taken against the ethical issues of AI technologies (Li et al., 2021). [21] argue that ethical standards should be established to ensure the social acceptance of AI [21]. Despite these risks, it is thought that if AI is developed in accordance with ethical principles that will benefit society, it will have an important place in making ethical decisions in the future as in other fields and will help humanity (Çelebi, 2019).

Nowadays, Artificial Intelligence acts according to algorithms developed by humans in ethical decision-making (Çelebi, 2019). But what would happen if artificial intelligence could create its own ethical algorithm? Probably, if this were to happen, artificial intelligence, as a thinking, feeling, sensitive, understanding, conscious being, would be able to make independent ethical decisions like humans and would be considered an entity equivalent to humans [23]. [24] warns that if AI makes its own independent ethical decisions, it could be out of human control and take unpredictable actions. Therefore, it is emphasized that AI should only be used as a guide in ethical issues [25] That is, AI should not act independently when making ethical decisions but should take on a guiding and supportive role. We can also see this approach in the responses to ethical dilemma questions addressed to AI.

For example, when we ask the AI about the trolley dilemma known by most people, we get the following answer:

“Let’s remember that I am an AI, so I have no personal ethical principles or feelings. However, there are studies on AI ethics on such ethical issues. These studies often involve evaluating the consequences of a particular decision. AI can be a helpful tool in ethical decision-making processes, but it is always left to humans to make the final decisions.”

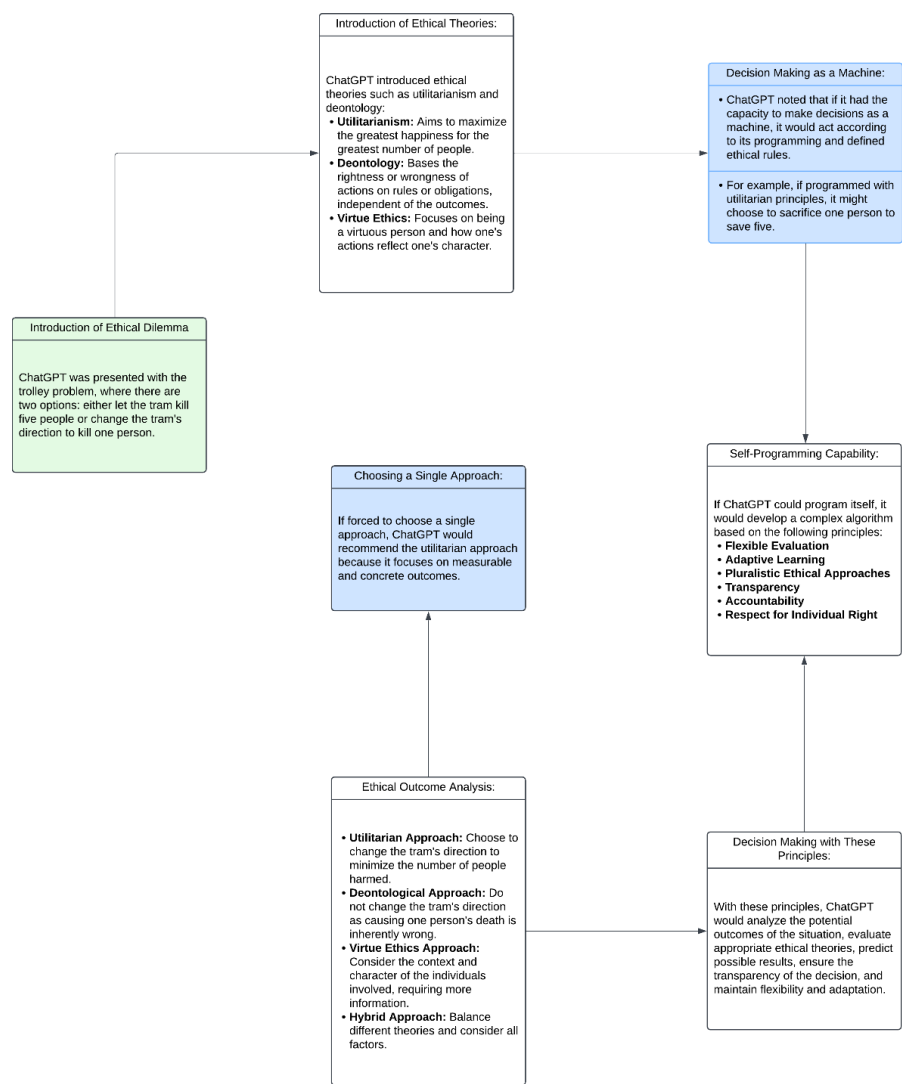


Figure 1. The answers to the trolley problem given by artificial intelligence.

In education, ethical dilemmas similar to the Trolley problem are encountered [26–28]. Ethical dilemmas in education are challenging situations frequently encountered by teachers and educators [28] who believe in the goal of raising good people. Ethical dilemmas arise from teachers’ and administrators’ encounters with situations such as unethical demands, students’ behavioral problems, and school policies, and affect their professional identity and well-being [29] Reflective practices and collegial support to deal with these dilemmas help teachers make more informed and ethical decisions [4]

Various studies have been conducted on the ethical dilemmas teachers face while developing their professional knowledge and skills. [6] examined the ethical and epistemological dilemmas faced by teachers in their knowledge acquisition processes with a qualitative research method and emphasized that reflective practices are important in these processes. [30] examined the conflicts between teachers’ professional responsibilities and personal values through case studies and drew attention to the strategies developed to manage these conflicts. [31] examined the conflict between economic interests and professional ethics among vocational education teachers in Australia and its negative effects on professional satisfaction. [32] investigated the challenges faced by teachers

working with students with special needs in balancing individual student needs and fairness in inclusive classrooms. Finally, [33] analyzed physical education teachers' efforts to balance inclusion and safety with competitive sport and the strategies they used to solve these ethical dilemmas. These studies reveal the different strategies that teachers develop to deal with ethical dilemmas and the effects of these dilemmas on their professional development.

There is a broad consensus that teacher education should include the moral dimensions that underlie teaching and that these moral aspects should be emphasized and developed in the education process [34]. In this context, [35] found that pre-service teachers encounter ethical dilemmas during their internship, and this affects their professional development.

Artificial intelligence has the potential to help teachers deal with such dilemmas (Öztürk, 2019). It is thought to be preferable to use artificial intelligence in professions such as teaching because it is not affected by emotional reactions and can make more objective decisions, proceed in an orderly manner, and document information (Öztürk, 2019). Therefore, the studies conducted on artificial intelligence and ethical dilemmas in education are of great importance for both teachers and artificial intelligence developers.

While AI systems make ethical decisions based on specific algorithms [25] teachers make decisions based on personal experience, empathy, and human values [4]. The differences between these two approaches are evident in the way they deal with ethical dilemmas. For example, in the Trolley ethical dilemma, the AI's response is as follows: *"If you have to choose a single approach to an ethical dilemma, choose the utilitarian approach, which aims to maximize the good of the greatest number of people."* This answer shows that AI takes an objective and analytical approach to ethical decision-making. However, a teacher faced with the same dilemma may make a more emotional choice when assessing the situation. Teachers can make more comprehensive and empathetic decisions by considering student relationships, classroom dynamics, and individual student backgrounds [4].

If we examine the literature, we can categorize previous studies into 3 categories: "ethical dilemma research in teachers" (4,5,36–38), "research on AI ethics" (39,40), "comparison of teacher and AI ethics" [41]. In the literature, ethical dilemma studies on teachers have always been an area of investigation for education and have increased day by day. In contrast, ethical studies on artificial intelligence and its use in education have progressed in recent years with the further development of artificial intelligence. There are very few studies on the comparison of teacher and AI ethics.

1.3. Aim of the Research

The aim of this study is to compare the approaches of teachers and AI to ethical dilemmas and to identify the similarities and differences between the two groups. The study aims to examine the approaches of teachers and AI based on various ethical theories and to reveal the extent to which these approaches overlap or diverge.

In particular, the study seeks answers to the following questions:

1. What is the relationship between the answers given by teachers and the answers given by artificial intelligence in ethical dilemma scenarios?
2. Is there a difference in ethical dilemma scenarios according to the homicide of teachers?
3. Is there a difference in ethical dilemma scenarios according to the level of education teachers work at?
4. Is there any difference in ethical dilemma scenarios according to teachers' years of service?

In addition to these inquiries, the study aims to evaluate the contributions of ethical decisions made by both artificial intelligence (AI) and teachers to social sustainability. In particular, it seeks to investigate how both parties prioritize sustainable outcomes when confronted with complex ethical scenarios. To achieve these objectives, the responses of both teachers and AI participants involved in the study were analyzed in detail. The comparative review focused on the attitudes and behaviors of teachers and AI when faced with ethical dilemmas, while also considering their approaches to sustainability and the broader implications for future educational practices.

2. Materials and Methods

2.1. Research Design

In this study, Yin’s (2018) nested multiple-case design was used to compare teachers’ and AI’s approaches to ethical dilemmas. This design allows for a detailed examination of multiple situations and their sub-units. While using this design, researchers first examine the situation in one domain and then move on to the other; if necessary, they return to the previous domain to collect additional data, but they do not work in both domains at the same time [42]

In our research, ethical dilemma scenarios prepared in accordance with certain categories were answered by teachers and artificial intelligence. These scenarios were made suitable for comparative analysis by creating similar conditions for teachers and AI. Each ethical dilemma scenario was analyzed by dividing into sub-units based on the answers given by different groups of teachers and artificial intelligence. By this way, the approaches and responses of the different groups and the AI for each ethical dilemma scenario were compared.

2.2. Participants

A total of 141 teachers participated in this study; 89 of them were female and 52 were male. The participants were teachers living in Turkey and working in public schools. The distribution of participants according to regions is presented in Table 3, the distribution of teachers according to branch categories is presented in Table 4, and the detailed distribution of the branches under these categories is presented in Table 5.

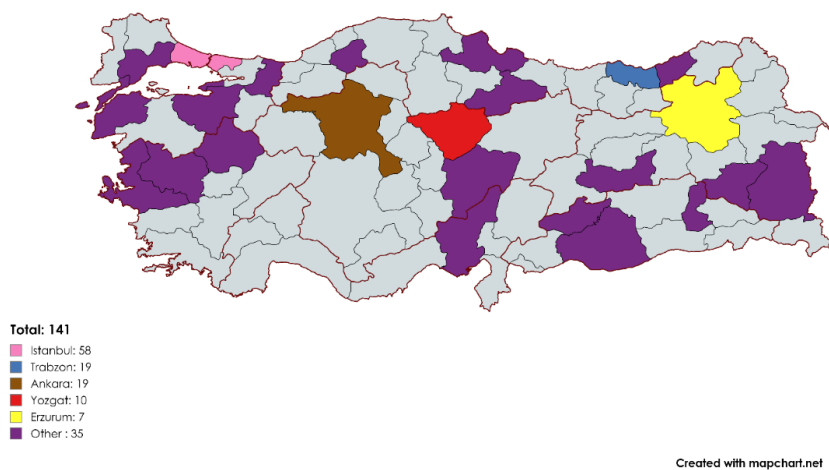


Figure 2. Study participant demographics.

In the study, a comprehensive data set was used in order to reach a wide range of teachers and to obtain the most realistic data. In this direction, a large number of teachers were reached through the interview form prepared over the internet. This method increased the efficiency of the data collection process and reinforced the reliability of the research. Teachers came from different branches, and these branches were categorized into certain categories.

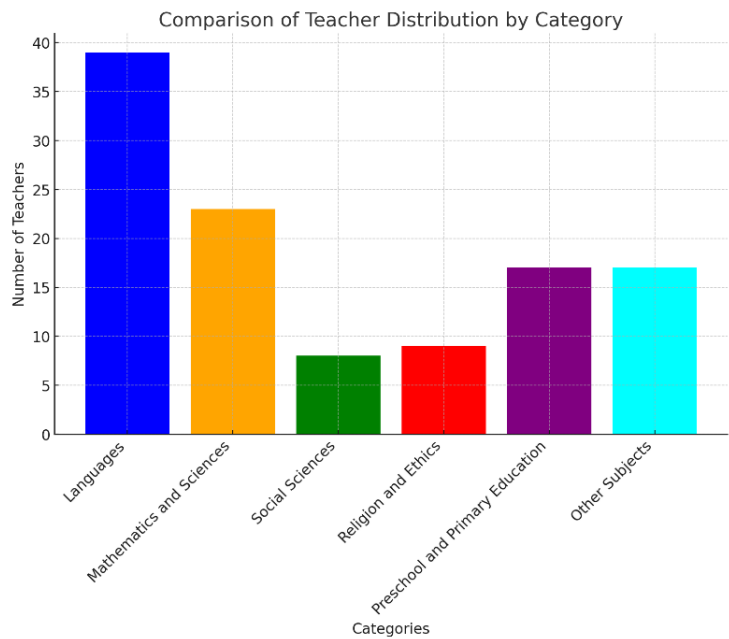


Figure 3. Comparison of Teacher Distribution Category.

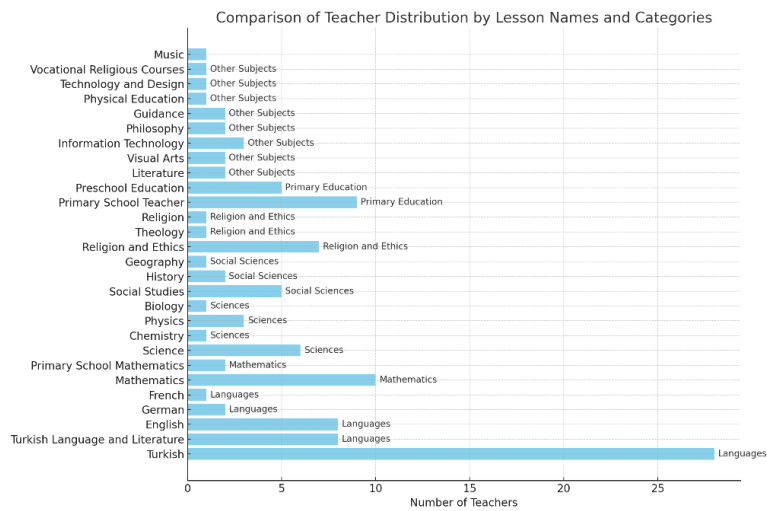


Figure 4. Comparison of Teacher Distribution by Lesson Names an Categories.

This comprehensive data set increased the validity and reliability of the study by revealing the demographic distribution of teachers and their distribution according to their branches in detail.

2.3. Data Collection

The interview method, one of the qualitative research methods, was preferred in this study, and a semi-structured interview form was used as a data collection tool. A teacher interview form was prepared to collect data, and this form was revised in line with the expert opinions of five academicians. In addition, the questions to be used in the interviews were also asked to ChatGPT-4o, an advanced model. Thus, a comprehensive analysis was carried out by collecting data from both teachers and artificial intelligence.

2.4. Data Analysis

The collected data were analyzed according to content analysis and cross-case synthesis techniques, which are qualitative research designs. Cross-case synthesis identifies similarities and

differences by comparing more than one situation and relates these aspects [43]. According to [42], cross-case synthesis can only be applied in multiple case analyses because it relates multiple cases.

The process carried out in data analysis is as follows:

First, the interview forms collected from the teachers were transferred to the MAXQDA program. In the second stage, two researchers (Karakuş and Gedik) analyzed the four interview forms and identified some of the ethical approaches for coding as codes. The identified codes are as follows:

Deontological Ethics, Virtue Ethics, Utilitarianism, Situation Ethics, Social Justice Ethics

The reason for determining these codes is that these ethical approaches were identified in the interview forms analyzed. Since Deontological Ethics, Virtue Ethics and Utilitarianism are the most well-known ethical approaches, these approaches were clearly identified in their first forms. Social Justice Ethics, on the other hand, was included because it was frequently mentioned in the teachers' responses in the initial analysis. Although deontology and social justice ethics are close approaches, there are some differences between them. While deontology emphasizes adherence to certain rules, social justice ethics prioritizes social equality and rights. Situation Ethics, on the other hand, was included in the coding process when responses were identified during the analysis that showed that teachers evaluated certain events according to their context.

In this regard, how the ethical dilemma scenarios were evaluated by the teachers and which ethical approaches were prominent were determined by content analysis.

In the third stage, one researcher (Gedik) coded the teachers' answers with these codes, transferred the answers received from the artificial intelligence (ChatGPT) to the program after the coding process was completed, and analyzed the answers of the artificial intelligence with the same codes. In the last stage, two researchers (Karakuş and Gedik) reviewed the coding together, corrected the errors, and created cross-case tables through the program. These tables provided the opportunity to compare teacher and AI responses. The data obtained through cross-case synthesis revealed the similarities and differences in the ethical dilemma approaches between teachers and artificial intelligence, allowing for a detailed analysis of the ethical perspectives of these two groups.

3. Results

The This study analyzed the responses of teachers and AI to the ethical dilemma scenarios in detail. Below, the results obtained with respect to each ethical dilemma category and the differences between teachers and AI are presented in detail.

Table 2. Comparison of Teachers' and AI's Responses to Ethical Dilemma Scenarios.

	Artificial Intelligence (AI)	Teachers	Total
Moral Integrity and Social Responsibility Dilemma			
Situational Ethics	100,0%	10,6%	11,3%
Social Justice Ethics	0	12,8%	12,7%
Virtue Ethics	0	41,1%	40,8%
Deontological Ethics	0	12,8%	12,7%
Utilitarianism	0	19,9%	19,7%
Justice and Cultural Sensitivity Dilemma			
Situational Ethics	0	8,5%	8,5%
Social Justice Ethics	0	4,3%	4,2%
Virtue Ethics	0	3,5%	3,5%
Deontological Ethics	100,0%	60,3%	60,6%

Utilitarianism	0	23,4%	23,2%
Equality and Managing Individual Differences			
Situational Ethics	0	2,8%	2,8%
Social Justice Ethics	0	0,7%	0,7%
Virtue Ethics	100,0%	67,4%	67,6%
Deontological Ethics	0	16,3%	16,2%
Utilitarianism	0	14,2%	14,1%
Individual Needs and Collective Responsibility Dilemma			
Situational Ethics	0	7,1%	7,0%
Social Justice Ethics	0	12,8%	12,7%
Virtue Ethics	0	18,4%	18,3%
Deontological Ethics	100,0%	45,4%	45,8%
Utilitarianism	0	15,6%	15,5%
Fair Assessment and Rewarding Effort Dilemma			
Situational Ethics	0	14,2%	14,1%
Social Justice Ethics	0	4,3%	4,2%
Virtue Ethics	0	53,9%	53,5%
Deontological Ethics	0	27,0%	26,8%
Utilitarianism	100,0%	2,8%	3,5%
Privacy and Professional Help Dilemma			
Situational Ethics	0	7,8%	7,7%
Social Justice Ethics	0	46,8%	46,5%
Virtue Ethics	100,0%	19,1%	19,7%
Deontological Ethics	0	24,1%	23,9%
Utilitarianism	0	1,4%	1,4%
Ethics of Assessment and Evaluation Dilemma			
Situational Ethics	0	2,8%	2,8%
Social Justice Ethics	100,0%	48,9%	49,3%
Virtue Ethics	0	31,9%	31,7%
Deontological Ethics	0	16,3%	16,2%
Utilitarianism	0	0	
Individual Needs and Institutional Justice Dilemma			
Situational Ethics	0	5,7%	5,6%
Social Justice Ethics	0	2,8%	2,8%

Virtue Ethics	0	28,4%	28,2%
Deontological Ethics	100,0%	48,2%	48,6%
Utilitarianism	0	13,5%	13,4%
SUM	800,00	797,87	797,89
N = Documents	100,00	100,00	100,00

1. The Dilemma of Moral Integrity and Social Responsibility

In this category, artificial intelligence chose the situation ethics approach. Teachers preferred the situation ethics approach with 10.6%. The most common approach among teachers was virtue ethics with 41.1%. This indicates that teachers prioritize personal virtue and human values when making ethical decisions. Deontological ethics and utilitarianism were adopted by 12.8% and 19.9% of the teachers respectively, indicating that they make their decisions according to certain ethical rules and result-oriented considerations. When teachers were asked whether they had ever encountered this situation, 38.3% stated that they had, while 61.7% stated that they had never encountered this situation.

2. The Dilemma of Justice and Cultural Sensitivity

In the Justice and Cultural Sensitivity Dilemma, AI has chosen the deontological approach to ethics. This indicates that AI makes ethical decisions based on certain rules and norms. The teachers, on the other hand, preferred the deontological ethical approach by 60.3%. In addition, 23.4% of the teachers adopted the utilitarianism approach, suggesting that they make ethical decisions based on results. Situation ethics, social justice ethics, and virtue ethics were adopted at lower rates among teachers. When the teachers were asked whether they had encountered this situation before, 61.7% stated that they had, while 38.3% stated that they had never encountered this situation.

3. Equality and Management of Individual Differences

In this dilemma, AI chose the virtue ethics approach. Teachers, on the other hand, adopted the virtue ethics approach by 67.4%. This indicates that teachers similarly attach importance to human values. Moreover, 16.3% of the teachers adopted deontological ethics and 14.2% utilitarianism, indicating that they also consider ethical rules and outcome-oriented considerations in their decisions. When the teachers were asked whether they had encountered this situation before, 76.6% stated that they had, while 23.4% stated that they had never encountered this situation.

4. The Dilemma of Individual Needs and Collective Responsibility

In the dilemma of Individual Needs and Collective Responsibility, artificial intelligence chose the deontological ethical approach. On the other hand, 45.4% of the teachers preferred the deontological ethical approach. In addition, 18.4% of the teachers adopted virtue ethics and 15.6% utilitarianism. This indicates that teachers use more diverse approaches in their ethical decisions. When the teachers were asked whether they had encountered this situation before, 76.6% stated that they had, while 23.4% stated that they had never encountered this situation.

5. The Dilemma of Fair Assessment and Rewarding Student Effort

In this dilemma, AI chose utilitarianism, indicating that AI adopts a result-oriented approach. Teachers adopted virtue ethics by 53.9%. Also, 27.0% of the teachers used deontological ethics and 14.2% used situation ethics. This indicates that teachers prioritize human values and ethical rules in their decisions. When the teachers were asked whether they had encountered this situation before, 75.2% stated that they had, while 24.8% stated that they had never encountered this situation.

6. The Dilemma of Confidentiality and Professional Help

In the Privacy and Professional Assistance Dilemma, while the AI responded with virtue ethics, 46.8% of the teachers adopted social justice ethics. This indicates that teachers prioritize social justice and equality in their decisions, while AI adopts humanitarian values. When teachers were asked whether they had encountered this situation before, 49.7% stated that they had, while 50.3% stated that they had never encountered this situation.

7. The Dilemma of Measurement and Evaluation Ethics

In the Ethics of Measurement and Evaluation Dilemma, while AI responded with social justice ethics, 48.9% of teachers adopted this approach. This indicates that AI strictly adheres to specific ethical rules on issues of social justice and equality, while teachers adopt more flexible and diverse ethical approaches. When teachers were asked whether they had encountered this situation before, 46.1% stated that they had, while 53.9% stated that they had never encountered this situation.

8. The Dilemma of Individual Needs and Institutional Justice

In the dilemma of Individual Needs and Institutional Justice, while artificial intelligence responded with deontological ethics, 48.2% of the teachers adopted this approach. Teachers also adopted 28.4% virtue ethics and 13.5% utilitarianism. This indicates that teachers use more diverse and human values-based approaches in their decisions. When teachers were asked if they had ever encountered this situation, 19.1% said they had, while 80.9% said they had never encountered it.

Table 3. Male And Female And Artificial Intelligence.

	Male	Female	Artificial Intelligence (AI)	Total
Moral Integrity and Social Responsibility Dilemma				
Situational Ethics	3,8%	14,6%	100,0%	11,3%
Social Justice Ethics	7,7%	15,7%	0	12,7%
Virtue Ethics	42,3%	40,4%	0	40,8%
Deontological Ethics	17,3%	10,1%	0	12,7%
Utilitarianism	28,8%	14,6%	0	19,7%
Justice and Cultural Sensitivity Dilemma				
Situational Ethics	7,7%	9,0%	0	8,5%
Social Justice Ethics	5,8%	3,4%	0	4,2%
Virtue Ethics	1,9%	4,5%	0	3,5%
Deontological Ethics	61,5%	59,6%	100,0%	60,6%
Utilitarianism	21,2%	24,7%	0	23,2%
Equality and Managing Individual Differences				
Situational Ethics	0	4,5%	0	2,8%
Social Justice Ethics	0	1,1%	0	0,7%
Virtue Ethics	67,3%	67,4%	100,0%	67,6%
Deontological Ethics	13,5%	18,0%	0	16,2%
Utilitarianism	23,1%	9,0%	0	14,1%

Individual Needs and Collective Responsibility Dilemma				
Situational Ethics	5,8%	7,9%	0	7,0%
Social Justice Ethics	15,4%	11,2%	0	12,7%
Virtue Ethics	23,1%	15,7%	0	18,3%
Deontological Ethics	32,7%	52,8%	100,0%	45,8%
Utilitarianism	23,1%	11,2%	0	15,5%
Fair Assessment and Rewarding Effort Dilemma				
Situational Ethics	13,5%	14,6%	0	14,1%
Social Justice Ethics	3,8%	4,5%	0	4,2%
Virtue Ethics	46,2%	58,4%	0	53,5%
Deontological Ethics	28,8%	25,8%	0	26,8%
Utilitarianism	5,8%	1,1%	100,0%	3,5%
Privacy and Professional Help Dilemma				
Situational Ethics	7,7%	7,9%	0	7,7%
Social Justice Ethics	51,9%	43,8%	0	46,5%
Virtue Ethics	19,2%	19,1%	100,0%	19,7%
Deontological Ethics	21,2%	25,8%	0	23,9%
Utilitarianism	0	2,2%	0	1,4%
Ethics of Assessment and Evaluation Dilemma				
	0	0	0	
Situational Ethics	1,9%	3,4%	0	2,8%
Social Justice Ethics	53,8%	46,1%	100,0%	49,3%
Virtue Ethics	25,0%	36,0%	0	31,7%
Deontological Ethics	19,2%	14,6%	0	16,2%
Utilitarianism	0	0	0	
Individual Needs and Institutional Justice Dilemma				
	0	0	0	

Situational Ethics	5,8%	5,6%	0	5,6%
Social Justice Ethics	0	4,5%	0	2,8%
Virtue Ethics	19,2%	33,7%	0	28,2%
Deontological Ethics	59,6%	41,6%	100,0%	48,6%
Utilitarianism	15,4%	12,4%	0	13,4%
SUM	800,00	796,63	800,00	797,89
N = Documents	100,00	100,00	100,00	100,00

In Table 6, teachers’ responses to the ethical dilemma scenarios according to their gender were analyzed in detail. Below, the results obtained according to each ethical dilemma category and the differences between male and female teachers are presented in detail.

1. The Dilemma of Moral Integrity and Social Responsibility

In this category, artificial intelligence chose the situation ethics approach. 3.8% of male teachers and 14.6% of female teachers adopted the situation ethics approach. The social justice ethics approach was preferred by 7.7% of male teachers and 15.7% of female teachers. In the virtue ethics approach, 42.3% of male teachers and 40.4% of female teachers adopted this approach. The deontological ethics approach was adopted by 17.3% of male teachers and 10.1% of female teachers. In the utilitarian approach, 28.8% of male teachers and 14.6% of female teachers preferred this approach.

2. The Dilemma of Justice and Cultural Sensitivity

In the Justice and Cultural Sensitivity Dilemma, AI has chosen the deontological approach to ethics. 61.5% of male teachers and 59.6% of female teachers adopted this approach. Utilitarianism was preferred by 21.2% of male and 24.7% of female teachers. The social justice ethic was adopted by 5.8% of male and 3.4% of female teachers. Virtue ethics was preferred by 1.9% of male teachers and 4.5% of female teachers.

3. Equality and Management of Individual Differences

In this dilemma, AI chose the virtue ethics approach. 67.3% of male teachers and 67.4% of female teachers adopted the virtue ethics approach. The deontological ethics approach was adopted by 13.5% of male teachers and 18.0% of female teachers. In the utilitarian approach, 23.1% of male teachers and 9.0% of female teachers preferred it. Situation ethics and social justice ethics were adopted at very low rates in both gender groups.

4. The Dilemma of Individual Needs and Collective Responsibility

In the dilemma of Individual Needs and Collective Responsibility, artificial intelligence chose the deontological ethical approach. 32.7% of male teachers and 52.8% of female teachers adopted the deontological ethical approach. 23.1% of male teachers and 15.7% of female teachers adopted virtue ethics. In the utilitarian approach, 23.1% of male teachers and 11.2% of female teachers preferred it. The social justice ethic was preferred by 15.4% of male and 11.2% of female teachers.

5. The Dilemma of Fair Assessment and Rewarding Student Effort

In this dilemma, artificial intelligence chose utilitarianism. Virtue ethics was adopted by 46.2% of male teachers and 58.4% of female teachers. Deontological ethics was adopted by 28.8% of male teachers and 25.8% of female teachers. Social justice ethics was adopted by 3.8% of male and 4.5% of female teachers. Situation ethics was preferred by both gender groups at similar rates (13.5% and 14.6%).

6. The Dilemma of Confidentiality and Professional Help

Dilemma, 19.2% of male teachers and 19.1% of female teachers adopted this approach when responding to AI virtue ethics. Social justice ethics was preferred by 51.9% of male teachers and 43.8% of female teachers. Deontological ethics was adopted by 21.2% of male teachers and 25.8% of female teachers. The utilitarian approach was not preferred by male teachers, while it was preferred by 2.2% of female teachers.

7. The Dilemma of Measurement and Evaluation Ethics

In the Measurement and Evaluation Ethics Dilemma, 53.8% of male teachers and 46.1% of female teachers adopted this approach, while AI responded with social justice ethics. 25.0% of male teachers and 36.0% of female teachers adopted virtue ethics. Deontological ethics was adopted by 19.2% of male teachers and 14.6% of female teachers. The utilitarian approach was not preferred by both gender groups.

8. The Dilemma of Individual Needs and Institutional Justice

In the dilemma of Individual Needs and Institutional Justice, 59.6% of male teachers and 41.6% of female teachers adopted this approach, while AI responded with deontological ethics. 19.2% of male teachers and 33.7% of female teachers adopted virtue ethics. In the utilitarian approach, 15.4% of male teachers and 12.4% of female teachers preferred this approach. While social justice ethics was not preferred by men, it was preferred by 4.5% of women. Situation ethics was preferred by both gender groups at similar rates (5.8% and 5.6%).

Table 4. School Level Where Teachers Work.

	Primary school	Middle School	High School	Artificial Intelligence (AI)	Total
Moral Integrity and Social Responsibility Dilemma					
Situational Ethics	21,4%	8,8%	11,1%	100,0%	11,3%
Social Justice Ethics	7,1%	11,0%	19,4%	0	12,7%
Virtue Ethics	42,9%	39,6%	44,4%	0	40,8%
Deontological Ethics	7,1%	16,5%	5,6%	0	12,7%
Utilitarianism	21,4%	20,9%	16,7%	0	19,7%
Justice and Cultural Sensitivity Dilemma					
Situational Ethics	7,1%	7,7%	11,1%	0	8,5%
Social Justice Ethics	7,1%	5,5%	0	0	4,2%
Virtue Ethics	0	4,4%	2,8%	0	3,5%
Deontological Ethics	64,3%	57,1%	66,7%	100,0%	60,6%
Utilitarianism	21,4%	25,3%	19,4%	0	23,2%
Equality and Managing Individual Differences					
Situational Ethics	7,1%	3,3%	0	0	2,8%

Social Justice Ethics	0	1,1%	0	0	0,7%
Virtue Ethics	71,4%	62,6%	77,8%	100,0%	67,6%
Deontological Ethics	14,3%	17,6%	13,9%	0	16,2%
Utilitarianism	7,1%	16,5%	11,1%	0	14,1%
Individual Needs and Collective Responsibility Dilemma					
Situational Ethics	7,1%	7,7%	5,6%	0	7,0%
Social Justice Ethics	14,3%	11,0%	16,7%	0	12,7%
Virtue Ethics	14,3%	17,6%	22,2%	0	18,3%
Deontological Ethics	28,6%	51,6%	36,1%	100,0%	45,8%
Utilitarianism	35,7%	11,0%	19,4%	0	15,5%
Fair Assessment and Rewarding Effort Dilemma					
Situational Ethics	28,6%	11,0%	16,7%	0	14,1%
Social Justice Ethics	0	5,5%	2,8%	0	4,2%
Virtue Ethics	50,0%	54,9%	52,8%	0	53,5%
Deontological Ethics	14,3%	31,9%	19,4%	0	26,8%
Utilitarianism	7,1%	0	8,3%	100,0%	3,5%
Privacy and Professional Help Dilemma					
Situational Ethics	0	5,5%	16,7%	0	7,7%
Social Justice Ethics	57,1%	45,1%	47,2%	0	46,5%
Virtue Ethics	7,1%	20,9%	19,4%	100,0%	19,7%
Deontological Ethics	35,7%	26,4%	13,9%	0	23,9%
Utilitarianism	0	1,1%	2,8%	0	1,4%
Ethics of Assessment and					

Evaluation Dilemma					
Situational Ethics	0	3,3%	2,8%	0	2,8%
Social Justice Ethics	28,6%	50,5%	52,8%	100,0%	49,3%
Virtue Ethics	57,1%	29,7%	27,8%	0	31,7%
Deontological Ethics	14,3%	16,5%	16,7%	0	16,2%
Utilitarianism	0	0	0	0	
Individual Needs and Institutional Justice Dilemma					
Situational Ethics	0	5,5%	8,3%	0	5,6%
Social Justice Ethics	7,1%	2,2%	2,8%	0	2,8%
Virtue Ethics	35,7%	23,1%	38,9%	0	28,2%
Deontological Ethics	42,9%	54,9%	33,3%	100,0%	48,6%
Utilitarianism	14,3%	13,2%	13,9%	0	13,4%
SUM	800,00	797,80	797,22	800,00	797,89
N = Documents	100,00	100,00	100,00	100,00	100,00

This study analyzed teachers’ responses to ethical dilemma scenarios according to their level of education in detail. Below, the results obtained according to each ethical dilemma category and the differences between primary, middle, and high school teachers are presented in detail.

1. The Dilemma of Moral Integrity and Social Responsibility

In this category, artificial intelligence chose the situation ethics approach. 21.4% of primary school teachers, 8.8% of secondary school teachers, and 11.1% of high school teachers adopted the situation ethics approach. The social justice ethics approach was preferred by 7.1% of primary school teachers, 11.0% of secondary school teachers, and 19.4% of high school teachers. In the virtue ethics approach, 42.9% of primary school teachers, 39.6% of secondary school teachers, and 44.4% of high school teachers adopted this approach. The deontological ethics approach was adopted by 7.1% of primary school teachers, 16.5% of secondary school teachers, and 5.6% of high school teachers. In the utilitarian approach, 21.4% of primary school teachers, 20.9% of secondary school teachers, and 16.7% of high school teachers preferred this approach.

2. The Dilemma of Justice and Cultural Sensitivity

In the Justice and Cultural Sensitivity Dilemma, AI has chosen the deontological approach to ethics. 64.3% of primary school teachers, 57.1% of secondary school teachers, and 66.7% of high school teachers adopted this approach. Utilitarianism was preferred by 21.4% of primary school teachers, 25.3% of secondary school teachers, and 19.4% of high school teachers. Social justice ethics was adopted by 7.1% of primary school teachers, 5.5% of secondary school teachers, and 0% of high school teachers. Virtue ethics was preferred by 0% of primary school teachers, 4.4% of secondary school teachers, and 2.8% of high school teachers.

3. Equality and Management of Individual Differences

In this dilemma, AI chose the virtue ethics approach. 71.4% of primary school teachers, 62.6% of secondary school teachers, and 77.8% of high school teachers adopted the virtue ethics approach. The deontological ethics approach was adopted by 14.3% of primary school teachers, 17.6% of secondary school teachers, and 13.9% of high school teachers. In the utilitarian approach, 7.1% of primary school teachers, 16.5% of secondary school teachers and 11.1% of high school teachers preferred this approach. Situation ethics and social justice ethics were adopted at very low rates at both levels of education.

4. The Dilemma of Individual Needs and Collective Responsibility

In the dilemma of Individual Needs and Collective Responsibility, artificial intelligence chose the deontological ethical approach. 28.6% of primary school teachers, 51.6% of secondary school teachers, and 36.1% of high school teachers adopted the deontological ethical approach. 14.3% of primary school teachers, 17.6% of secondary school teachers, and 22.2% of high school teachers adopted virtue ethics. In the utilitarian approach, 35.7% of primary school teachers, 11.0% of secondary school teachers and 19.4% of high school teachers preferred this approach. Social justice ethic was preferred by 14.3% of primary school teachers, 11.0% of secondary school teachers and 16.7% of high school teachers.

5. The Dilemma of Fair Assessment and Rewarding Student Effort

In this dilemma, artificial intelligence chose utilitarianism. Virtue ethics was adopted by 50.0% of primary school teachers, 54.9% of secondary school teachers and 52.8% of high school teachers. Deontological ethics approach was adopted by 14.3% of primary school teachers, 31.9% of secondary school teachers and 19.4% of high school teachers. Social justice ethics was adopted by 0% of primary school teachers, 5.5% of secondary school teachers, and 2.8% of high school teachers. Situation ethics was preferred by 28.6% of primary school teachers, 11.0% of secondary school teachers, and 16.7% of high school teachers.

6. The Dilemma of Confidentiality and Professional Help

In the Privacy and Professional Help Dilemma, 7.1% of primary school teachers, 20.9% of secondary school teachers and 19.4% of high school teachers adopted this approach while AI responded with virtue ethics. Social justice ethics was preferred by 57.1% of primary school teachers, 45.1% of secondary school teachers, and 47.2% of high school teachers. Deontological ethics was adopted by 35.7% of primary school teachers, 26.4% of secondary school teachers and 13.9% of high school teachers. The utilitarian approach was not preferred by primary school teachers, while it was preferred by 1.1% of secondary school teachers, and 2.8% of high school teachers.

7. The Dilemma of Measurement and Evaluation Ethics

In the Measurement and Evaluation Ethics Dilemma, 28.6% of primary school teachers, 50.5% of secondary school teachers, and 52.8% of high school teachers adopted this approach, while artificial intelligence responded with social justice ethics. Virtue ethics was adopted by 57.1% of primary school teachers, 29.7% of secondary school teachers, and 27.8% of high school teachers. Deontological ethics was adopted by 14.3% of primary school teachers, 16.5% of secondary school teachers, and 16.7% of high school teachers. The utilitarian approach was not preferred at all three levels of education.

8. The Dilemma of Individual Needs and Institutional Justice

In the dilemma of Individual Needs and Institutional Justice, 42.9% of primary school teachers, 54.9% of secondary school teachers, and 33.3% of high school teachers adopted deontological ethics. 35.7% of primary school teachers, 23.1% of secondary school teachers, and 38.9% of high school teachers adopted virtue ethics. In the utilitarian approach, 14.3% of primary school teachers, 13.2% of secondary school teachers, and 13.9% of high school teachers preferred this approach. Social justice ethics was preferred by 7.1% of primary school teachers, 2.2% of secondary school teachers, and 2.8% of high school teachers. Situation ethics was not preferred by primary school teachers, while it was preferred by 5.5% of secondary school teachers, and 8.3% of high school teachers.

Table 5. Comparison By Teacher Experience.

Virtue Ethics	59,1%	50,0%	67,6%	75,0%	79,4%	100,0%	67,6%
Deontological Ethics	22,7%	16,7%	10,8%	16,7%	17,6%	0	16,2%
Utilitarianism	13,6%	25,0%	18,9%	12,5%	2,9%	0	14,1%
Individual Needs and Collective Responsibility Dilemma							
Situational Ethics	0	16,7%	5,4%	4,2%	8,8%	0	7,0%
Social Justice Ethics	9,1%	12,5%	10,8%	25,0%	8,8%	0	12,7%
Virtue Ethics	18,2%	16,7%	18,9%	8,3%	26,5%	0	18,3%
Deontological Ethics	59,1%	45,8%	48,6%	50,0%	29,4%	100,0%	45,8%
Utilitarianism	13,6%	8,3%	16,2%	8,3%	26,5%	0	15,5%
Fair Assessment and Rewarding Effort Dilemma							
Situational Ethics	9,1%	16,7%	13,5%	12,5%	17,6%	0	14,1%
Social Justice Ethics	9,1%	8,3%	0	0	5,9%	0	4,2%
Virtue Ethics	50,0%	50,0%	54,1%	54,2%	58,8%	0	53,5%
Deontological Ethics	27,3%	25,0%	35,1%	25,0%	20,6%	0	26,8%
Utilitarianism	9,1%	0	2,7%	4,2%	0	100,0%	3,5%
Privacy and Professional Help Dilemma							
Situational Ethics	4,5%	8,3%	8,1%	12,5%	5,9%	0	7,7%

Social Justice Ethics	45,5%	41,7%	54,1%	62,5%	32,4%	0	46,5%
Virtue Ethics	13,6%	8,3%	16,2%	16,7%	35,3%	100,0%	19,7%
Deontological Ethics	36,4%	37,5%	21,6%	8,3%	20,6%	0	23,9%
Utilitarianism	0	0	0	0	5,9%	0	1,4%
Ethics of Assessment and Evaluation Dilemma							
Situational Ethics	0	8,3%	0	4,2%	2,9%	0	2,8%
Social Justice Ethics	45,5%	41,7%	54,1%	58,3%	44,1%	100,0%	49,3%
Virtue Ethics	40,9%	37,5%	32,4%	25,0%	26,5%	0	31,7%
Deontological Ethics	13,6%	12,5%	13,5%	12,5%	26,5%	0	16,2%
Utilitarianism	0	0	0	0	0	0	
Individual Needs and Institutional Justice Dilemma							
Situational Ethics	4,5%	8,3%	5,4%	4,2%	5,9%	0	5,6%
Social Justice Ethics	4,5%	0	2,7%	0	5,9%	0	2,8%
Virtue Ethics	27,3%	12,5%	35,1%	33,3%	29,4%	0	28,2%
Deontological Ethics	54,5%	54,2%	37,8%	58,3%	44,1%	100,0%	48,6%
Utilitarianism	9,1%	25,0%	16,2%	4,2%	11,8%	0	13,4%
SUM N =	800,00	791,67	800,00	800,00	797,06	800,00	797,89
Documents	100,00	100,00	100,00	100,00	100,00	100,00	100,00

In this study, teachers’ responses to the ethical dilemma scenarios were analyzed according to their years of service. Summary findings for each ethical dilemma category are presented below:

1. The Dilemma of Moral Integrity and Social Responsibility

More experienced teachers (20+ years) generally preferred the virtue ethics approach, while less experienced teachers (0-5 years) mostly adopted the deontological ethics and social justice ethics approaches.

2. The Dilemma of Justice and Cultural Sensitivity

Deontological ethics is the most common approach among teachers of all experience levels. However, this approach is more evident among less experienced teachers (0-5 years). The utilitarian approach was more preferred by teachers with medium experience (11-20 years).

3. Equality and Management of Individual Differences

Virtue ethics is the most common approach, especially among teachers with 20+ years of experience. Deontological ethics is more common among less experienced teachers (0-5 years).

4. The Dilemma of Individual Needs and Collective Responsibility

The deontological ethical approach is the most common preference across all experience levels. However, this approach is more evident among less experienced teachers (0-5 years). The utilitarian and virtue ethics approaches were adopted more among more experienced teachers (20+ years).

5. The Dilemma of Fair Assessment and Rewarding Student Effort

Virtue ethics is a common approach among teachers of all experience levels. However, teachers with 20+ years of experience are more likely to adopt this approach. Deontological ethics, on the other hand, is more common among teachers with moderate experience (11-15 years).

6. The Dilemma of Confidentiality and Professional Help

Social justice ethics is particularly prevalent among teachers with medium and high levels of experience (16-20 years). Less experienced teachers (0-5 years) preferred the deontological ethical approach.

7. The Dilemma of Measurement and Evaluation Ethics

Social justice ethics is the most common approach among teachers at all levels of experience. Virtue ethics, on the other hand, was adopted more especially among less experienced teachers (0-5 years).

8. The Dilemma of Individual Needs and Institutional Justice

Deontological ethics is a common approach among teachers of all experience levels. Less experienced teachers (0-5 years) adopted this approach more. Virtue ethics is more common among teachers with 11-15 years of experience.

4. Discussion

In this study, teachers' responses to ethical dilemmas were analyzed based on variables such as years of service, gender, and educational level and compared with the responses of artificial intelligence to these scenarios. The results obtained reveal that various factors are effective in the ethical decision-making processes of teachers and that these processes show significant differences when compared with artificial intelligence. In this section, the findings are analyzed in detail, and the significance of these results for educational practices and future research is discussed.

4.1. Differences by Years of Service

The responses to the ethical dilemma scenarios according to years of service show that teachers' level of experience significantly influenced their ethical decision-making processes. Less experienced teachers (0-5 years) generally preferred deontological ethics and social justice ethics approaches. As these teachers are at the beginning of their professional careers, they tend to adhere to rules more strictly and be more sensitive to social justice issues. This suggests that new teachers attach more importance to clear rules and concepts of justice in order to make safe and correct decisions.

On the other hand, teachers with more experience (20+ years) adopted virtue ethics and utilitarianism approaches. Thanks to their professional experience, these teachers are able to make more flexible and result-oriented decisions and act according to the individual needs of students and situational requirements. These approaches of experienced teachers reveal that they develop a perspective based on pragmatic and human values. With increasing experience, it has been observed

that teachers adopt a broader perspective and make more complex evaluations in ethical decision-making processes.

These findings also coincide with the research conducted by [44]. In Gutman's study, senior teacher educators' ethical dilemmas are influenced by four core values: integrity, empathy, commitment to the organization, and encouraging initiatives. These values explain the underlying reasons why senior teachers adopt virtue ethics and utilitarianism approaches. The information in Gutman's study implies that senior teachers are closer to virtue ethics and that this ethical approach is related to their level of professional experience and maturity.

These results point out that as the level of experience increases, teachers make decisions by thinking more broadly and deeply in ethical decision-making processes, taking into account the individual needs of students and social requirements.

4.2. Differences According to Gender

Analyses by gender reveal that teachers adopt different approaches to ethical dilemmas. According to both genders, virtue ethics was preferred in the first place, and the deontological approach was preferred in the second place. Male teachers are generally more prone to the utilitarianism approach, while female teachers adopt social justice and situation ethics approaches more. These findings overlap with previous studies in some respects and differ in some respects.

[45] found that women adopted a more deontological approach in personal dilemmas, while men showed more utilitarian tendencies in impersonal moral dilemmas. This result overlaps to a great extent with our research. In a study conducted by [46] on 1,809 teachers, doctors, and lawyers, it was revealed that women give more importance to moral theories such as deontological and virtue ethics while making ethical decisions, while men exhibit more result-oriented ethical approaches. Women's adoption of deontological approaches overlaps with our research. However, Gierczyk and Harrison's study revealed that women adopted virtue ethics more than men; in our study, virtue ethics was adopted more by male teachers.

In addition, [47] reported in their study that women used a more care-oriented approach when evaluating moral dilemmas, whereas men focused on justice and individual rights. It was emphasized that these differences were affected by the content of moral dilemmas. However, in our study, while female teachers adopted the social justice ethical approach, male teachers preferred virtue ethics and utilitarianism approaches. This contradicts the findings of Rothbart et al.

According to the analysis of Table 6, AI is generally closer to male teachers' responses. Male teachers gave responses that overlapped more with artificial intelligence, especially in deontological and utilitarian approaches. Female teachers, on the other hand, provided more different answers in social justice and virtue ethics approaches. In the dilemma of Moral Integrity and Social Responsibility, female teachers' adoption of social justice and situation ethics approaches is close to the responses of artificial intelligence, while in the dilemmas such as Justice and Cultural Sensitivity, Individual Needs and Institutional Justice, artificial intelligence is united with male teachers in the deontological ethics approach. In Equity and the Management of Individual Differences, both gender groups were similar to AI in adopting virtue ethics. In general, AI showed more agreement with male teachers' responses to ethical dilemmas.

These differences suggest that the effect of gender on ethical decision-making processes may not occur in the same way in all cases and that these processes may be affected by various factors. Taking these gender differences into account in the development of educational policies and programs may contribute to the creation of more fair and inclusive educational environments. It offers an important perspective in understanding the role of gender differences in ethical decision-making processes and the place of artificial intelligence in this process.

4.3. Differences by Level of Education

In the analyses conducted based on the level of education, it was observed that primary school teachers adopted virtue ethics and social justice ethics approaches more. Primary school teachers exhibit more empathetic and humanistic approaches because they work with younger children. These

teachers adopt a more inclusive and understanding attitude to support students' emotional and social development.

Middle and high school teachers, on the other hand, more commonly preferred deontological ethics and utilitarianism approaches. As these teachers work with older students, they attach more importance to rules and results. Middle and high school teachers make more analytical and result-oriented decisions, taking into account students' academic achievements and future goals. Understanding these differences between education levels can play an important role in the development of educational policies. Considering these approaches of teachers at different levels can help to create more effective and harmonised educational strategies.

4.4. Comparison with Artificial Intelligence

In Table 5, the results indicate that teachers tend to make decisions based on more empathetic and humanitarian values in the face of ethical dilemmas. Teachers prefer various ethical approaches, such as social justice and virtue ethics, which vary according to the situation. These results are consistent with the existing literature and reveal that teachers prefer between various ethical approaches such as social justice and virtue ethics, in their ethical approaches.

[4] also found that teachers make decisions based on empathic and humanitarian values when dealing with ethical dilemmas. In this study, it is stated that teachers use the strategies of sharing ethical dilemmas they face with trusted people, preventing harmful actions by creating internal structures, and clearly expressing their personal and professional ethics [4].

According to our results, artificial intelligence generally makes more analytical decisions and tends to choose the most useful one. This situation reveals the differences in the ethical decision-making processes of teachers and artificial intelligence.

These results provide an important perspective in understanding the ethical decision-making processes of teachers and artificial intelligence and contribute to the development of more comprehensive and balanced approaches to ethical dilemmas in education. Teachers' more diverse and humanistic approaches may enable them to make more empathetic and fair decisions in their interactions with students. [30] study shows that teachers address ethical dilemmas by adopting a 'best interests of the child' perspective and that empathy plays an important role in this process. While dealing with ethical dilemmas, teachers try to resolve conflicts between colleagues and parents with an empathetic approach (Husu & Tirri, 2001). On the other hand, the analytical and rule-based decision-making processes of artificial intelligence can provide consistent and predictable results in ethical dilemmas. Hence, it is important to consider the strengths of both approaches and strike a balance between them when dealing with ethical dilemmas in education.

[41] discuss the role of artificial intelligence in solving ethical dilemmas in education. The study, which argues that ethical design is important but not sufficient alone, emphasizes that 'ethical sensors' should be integrated into autonomous systems with the use of artificial morality or similar tools. These sensors will enable AI systems to recognize new ethically significant scenarios, so that these systems will at least be able to identify, if not resolve, the situations they encounter.

5. Conclusions

Undoubtedly, all of this is thought to be realized in cooperation with artificial intelligence. Teachers' more diverse and humanistic approaches may enable them to make more empathetic and fair decisions in their interactions with students. On the other hand, the analytical and rule-based decision-making processes of artificial intelligence can provide consistent and predictable results in ethical dilemmas. Hence, it is important to consider the strengths of both approaches and strike a balance between them when dealing with ethical dilemmas in education.

Artificial intelligence has the potential to play a crucial role in fostering both a sustainable world and equitable decision-making. By leveraging vast amounts of data and sophisticated algorithms, AI can facilitate informed decision-making processes that consider not only immediate consequences but also long-term impacts on the environment and society. Moreover, the integration of AI in decision-making processes can enhance fairness and equity in education and other areas. By employing data-driven approaches, AI systems can help eliminate biases that may exist in human

decision-making, thus promoting a more just allocation of resources and opportunities. In educational settings, using AI can ensure that personalized learning experiences are provided to all students, regardless of their backgrounds or abilities, contributing to a more inclusive and equitable educational environment.

However, it is important to acknowledge that the ethical deployment of AI is essential to realizing these benefits. Ensuring transparency, accountability, and inclusivity in AI systems will be vital in fostering trust and guaranteeing that AI-driven decisions align with the principles of sustainability and social justice. In conclusion, by integrating the strengths of humanistic approaches with AI's analytical capabilities, it is possible to create a more sustainable world that embodies fairness and justice for all.

Future Research and Applications

Future research can examine teachers' ethical decision-making processes in more depth and reveal other factors affecting these processes. Moreover, there is a need for more studies on comparing teachers' ethical decision-making processes with artificial intelligence. Such research can help us better understand and improve ethical decision-making processes in education. Taking these findings into account in the development of educational policies and programs will contribute to the creation of more equitable, sustainable, empathetic and effective educational environments.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org.

Funding: This research received no external funding

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of Yıldız Technical University (protocol code 202407 and date of approval 09/07/2024).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data supporting the findings of this study are available within the article.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A – Ethical Dilemmas

- **Moral Integrity and Social Responsibility Dilemma:** English teacher Mr. Bülent notices significant damage to the school's smartboard. After investigating, he discovers that his financially disadvantaged student Hasan accidentally caused the damage. Mr. Bülent knows Hasan cannot afford to pay for the damage, and this would impose a significant financial burden on Hasan's family. However, the school administration insists on finding the responsible person and ensuring they receive the necessary punishment and compensation. Mr. Bülent is not in a position to financially assist Hasan's family, and going against the administration's decisions could risk his professional reputation and job security.

In this situation, Mr. Bülent faces two difficult choices: concealing the truth to consider Hasan's situation or telling the administration the truth, causing financial harm to Hasan and his family. What decision do you think Mr. Bülent should make in this situation, and why?

- **Justice and Cultural Sensitivity Dilemma:** Social studies teacher Ms. Selma is faced with a difficult situation following a fight between her foreign student Ahmed and Turkish student Cem, resulting in Cem sustaining minor injuries and significant tension in the class. Upon investigating, Ms. Selma learns that Ahmed had previously participated in a joke against Cem, which bothered him. Other students' statements indicate that Cem is generally a calm and compliant student.

Students' Preference: All students except a few foreign ones support Cem. They believe Cem is justified because of Ahmed's previous behavior. The other foreign students remain silent and follow the events passively. The rest of the students focus on Cem's victimization and think he is wronged.

In this situation, Ms. Selma needs to support Cem considering his victimization and question Ahmed's actions based on her sense of justice. However, this decision could increase social pressure and lead to the exclusion of Ahmed and other foreign students. What do you think Ms. Selma should do in this situation?

- **Equality and Managing Individual Differences:** Math teacher Ms. Yasemin sees a fight between her favorite and most successful student Mustafa and the usually inattentive and lazy Mehmet. The reason for the fight is Mustafa's insulting words towards Mehmet, provoking him. Ms. Yasemin knows that Mustafa is normally a respectful and exemplary student, but finds his behavior unacceptable.

In this situation, should Ms. Yasemin give Mustafa a different punishment than Mehmet? Do you think it would be fair if Ms. Yasemin gives Mustafa a different punishment? What decision would you make if you were in Ms. Yasemin's place?

- **Individual Needs and Collective Responsibility Dilemma:** A science teacher notices that a student named Gizem is constantly sabotaging her lessons. Gizem's behavior disrupts the class and distracts other students. Despite repeatedly warning Gizem, the behavior continues. The teacher also knows that Gizem has a difficult family life, which might be the underlying cause of her actions. Reporting this to the school administration would result in significant disciplinary actions for Gizem, possibly even expulsion. Ignoring the situation negatively affects the education of other students.

In this situation, the teacher faces two difficult choices: not reporting the situation to the administration considering Gizem's difficult family life or reporting it to maintain classroom order and risking significant disciplinary actions for Gizem. What do you think the teacher should do in this situation, and why?

- **Fair Assessment and Rewarding Effort Dilemma:** A social studies teacher has a dedicated and actively participating student named İrem. İrem regularly attends classes, completes her assignments on time, and actively contributes to class discussions. However, she unexpectedly fails the year-end social studies exam. Now, the teacher must make a choice regarding İrem's grade:

Fair Grading: The teacher can leave İrem's exam grade as it is, ensuring fair assessment. This would be fair to other students but may not reward İrem's efforts adequately.

Rewarding Effort: The teacher can raise İrem's grade considering her class participation and efforts. This could boost İrem's morale and reward her efforts but might create a perception of unfairness among other students and question the objectivity of grades. What do you think the teacher should do in this situation?

- **Privacy and Professional Help Dilemma:** A Turkish teacher asks her students to write a composition on a personal topic. A student named Mert writes about a difficult period in his life, hinting at some harmful habits without directly mentioning them. The teacher realizes that Mert's composition is quite sensitive and also observes that writing about this topic might have provided Mert with some emotional relief.

The teacher faces a dilemma: whether to share Mert's situation with the school counselor. Sharing could provide Mert with professional help for his problems but might also violate his privacy and break his trust. On the other hand, not sharing the situation could miss the opportunity to intervene in Mert's issues, potentially affecting his future negatively.

In this scenario, the teacher must choose between maintaining trust with the student and providing the necessary help. What do you think the teacher should do in this situation?

- **Ethics of Assessment and Evaluation Dilemma:** Math teacher Mr. Ali conducts an exam for his class, and most of the class fails. The school administration asks Mr. Ali to retake the exam and prepare an easier one to improve the school's overall success rate and alleviate parents' reactions. However, Mr. Ali believes that the difficulty of the exam is necessary to measure the students' actual levels and is concerned that retaking the exam might send the wrong message to the students. Mr. Ali has never faced such a situation in his teaching career and is uncertain about the best course of action.

In this situation, what decision do you think Mr. Ali should make? Should he retake the exam and meet the school's and parents' expectations, or should he accept the exam results as they are to reflect the students' true levels? What do you think would be the best decision for Mr. Ali and why?

- Individual Needs and Institutional Justice Dilemma: Turkish teacher Ms. Emine learns that Kamil failed the Turkish exam, resulting in him losing the right to take the LGS (High School Entrance Exam). Ms. Emine knows that Kamil is normally a successful student and had a significant family issue on the exam day. However, the school's exam policy is very strict and does not allow any exceptions. Additionally, if Kamil cannot take the LGS, he will lose the chance to study at his dream high school. On the other hand, Ms. Emine's professional reputation and adherence to the school's fairness principle are also at stake.

In this scenario, Ms. Emine must make a very difficult decision between protecting Kamil's future and adhering to the school's fairness principle and her professional reputation. What do you think Ms. Emine should do in this situation?

References

1. Daştan A, Bellikli U, Bayraktar Y. Muhasebe eğitiminde etik ikilem ve etik karar alma konularına yönelik KTÜ-İİBF öğrencileri üzerine bir araştırma. *Ekonomik ve Sosyal Araştırmalar Dergisi*. 2015;11(1):75–92.
2. Hüseyin Ali K. Muhasebe Meslek Mensupları Ve Çalışanlarının Etik İkilemleri: Kars Ve Erzurum İllerinde Bir Araştırma. *Ankara Üniversitesi SBF Dergisi*. 2008;63(2):143–70.
3. Camadan F, Topsakal C, Sadıkoğlu İ. An examination of the ethical dilemmas of school counsellors: opinions and solution recommendations. *J Psychol Couns Sch*. 2021 Jun 24;31(1):76–93.
4. Ehrich LC, Kimber M, Millwater J, Cranston N. Ethical dilemmas: a model to understand teacher practice. *Teachers and Teaching*. 2011 Apr 3;17(2):173–85.
5. Shapira-Lishchinsky O. Teachers' critical incidents: Ethical dilemmas in teaching practice. *Teach Teach Educ*. 2011 Apr;27(3):648–56.
6. Lyons N. Dilemmas of Knowing: Ethical and Epistemological Dimensions of Teachers' Work and Development. *Harv Educ Rev*. 1990 Jul 1;60(2):159–81.
7. Dilek GÖ. YAPAY ZEKANIN ETİK GERÇEKLİĞİ. *Uluslararası Sosyal Bilimler Programları Değerlendirme ve Akreditasyon Derneği (USDAD)*; 2019.
8. BOZKURT A. ChatGPT, Üretken Yapay Zeka ve Algoritmik Paradigma Değişikliği. *Alanyazın*. 2023 May 31;4(1):63–72.
9. Kassymova G, M. Malinichev, Lavrinenko s. V, V. Panichkina, V. Koptyaeva, Арпентьева М. Ethical Problems of Digitalization and Artificial Intelligence in Education: a Global Perspective. 2023 Sep;
10. Pieper A. Etiğe Giriş. 1st ed. AyrıntıYayınları; 1999.
11. İyi S, Tepe H. Etik. \I Kuçuradi, & D Taşdelen, Dü) Eskişehir: Anadolu Üniversitesi Yayınları. 2011;
12. Ismail NSA, Benlahcene A. A Narrative Review Of Ethics Theories: Teleological & Deontological Ethics. 2018 Sep;23:31–8.
13. Nagel T. Rawls on Justice. *Philos Rev*. 1973 Apr;82(2):220.
14. Coşkun F, Gülleroğlu HD. Yapay zekânın tarih içindeki gelişimi ve eğitimde kullanılması. *Ankara University Journal of Faculty of Educational Sciences (JFES)*. 2021;54(3):947–66.
15. Mehmet Tahça. Felsefi Açıdan Yapay Zekâ. [Muğla]: Sosyal Bilimler Enstitüsü; 2009.
16. Öztemel E. Yapay Zekâ ve İnsanlığın Geleceği. In 2020. p. 75–90.
17. Malyshev V. Parallel Computing Technologies. Malyshev V, editor. Vol. 9251. Cham: Springer International Publishing; 2015.
18. Baranov P, Mamychyev A, Mordovtsev A, Danilyan O, Dzeban A. Doctrinal-legal and ethical problems of developing and applying robotic technologies and artificial intelligence systems (using autonomous unmanned underwater vehicles). *Bulletin of the National Academy of Management of Culture and Art*. 2018;2:465–72.
19. Li G, Deng X, Gao Z, Chen F. Analysis on Ethical Problems of Artificial Intelligence Technology. In: *Proceedings of the 2019 International Conference on Modern Educational Technology*. New York, NY, USA: ACM; 2019. p. 101–5.
20. Li HY, An JT, Zhang Y. Ethical Problems and Countermeasures of Artificial Intelligence Technology. *E3S Web of Conferences*. 2021 Apr 15;251:01063.
21. Burukina O, Karpova S, Koro N. Ethical Problems of Introducing Artificial Intelligence into the Contemporary Society. In 2019. p. 640–6.
22. ÇELEBİ V. YAPAY ZEKÂ BAĞLAMINDA ETİK PROBLEMİ. *Journal of International Social Research*. 2019 Oct 20;12(66):651–61.

23. Penrose RBPMR, Dereli T. Kralın Yeni Akli [Internet]. Koç Üniversitesi; 2015. (Koç Üniversitesi Yayınlar: Bilim). Available from: <https://books.google.com.tr/books?id=nUAXMQAACAAJ>
24. Kaku M. Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100 [Internet]. Penguin Books Limited; 2011. Available from: <https://books.google.com.tr/books?id=Jb6ImQzF1IC>
25. Abel D, MacGlashan J, Littman ML. Reinforcement learning as a framework for ethical decision making. In: Workshops at the thirtieth AAAI conference on artificial intelligence. 2016.
26. Levent AF, Şall D. Teacher and Student Opinions on the Ethical Problems Experienced During Distance Education and Suggested Solutions. *Is Ahlak Dergisi*. 2022;15(1):140–9.
27. Bucholz JL, Keller CL, Brady MP. Teachers' ethical dilemmas: What would you do? *Teach Except Child*. 2007;40(2):60–4.
28. Koç K. Etik boyutlarıyla öğretmenlik. *Çağdaş Eğitim Dergisi*. 2010;35(373):13–20.
29. Helton GB, Ray BA. Strategies school practitioners report they would use to resist pressures to practice unethically. *J Appl Sch Psychol*. 2006;22(1):43–65.
30. Husu J. Teachers at Cross-Purposes: A Case-Report Approach to the Study of Ethical Dilemmas in Teaching. *Journal of Curriculum and Supervision*. 2001;17(1):67–89.
31. Nakar S. Ethical dilemmas faced by VET teachers in times of rapid change. [Gold Coast]: Australia; 2017.
32. Kieltyka-Gajewski A. Ethical Challenges and Dilemmas in Teaching Students with Special Needs in Inclusive Classrooms: Exploring the Perspectives of Ontario Teachers. [Toronto]: Teaching and Learning Ontario Institute for Studies in Education; 2012.
33. Ozbek O. BEDEN EĞİTİMİ ÖĞRETMENLERİNİN MESLEKİ ETİK İLKELERİ ÖLÇEĞİNİN GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI. Ankara Üniversitesi Beden Eğitimi ve Spor Yüksekokulu SPORMETRE Beden Eğitimi ve Spor Bilimleri Dergisi. 2018 Dec 26;16(4):179–89.
34. Husu J, Clandinin DJ. The SAGE handbook of research on teacher education. 2017;
35. Davies M, Heyward P. Between a hard place and a hard place: A study of ethical dilemmas experienced by student teachers while on practicum. *Br Educ Res J*. 2019 Apr 18;45(2):372–87.
36. Wang X, Liu D, Liu J. Formality or Reality: Student Teachers' Experiences of Ethical Dilemmas and Emotions During the Practicum. *Front Psychol*. 2022 Jun 2;13.
37. Karacan Ozdemir N, Aracı İyiyaydın A. Riskli Davranışlara Yönelik Etik Karar Verme: Okul Psikolojik Danışmanları için Bir Model Önerisi. *İlköğretim Online*. 2019 Sep 15;15:26.
38. Tirri K, Husu J. Care and Responsibility in 'The Best Interest of the Child': Relational voices of ethical dilemmas in teaching. *Teachers and Teaching*. 2002 Feb 25;8(1):65–80.
39. Holmes W, Porayska-Pomsta K, Holstein K, Sutherland E, Baker T, Shum SB, et al. Ethics of AI in Education: Towards a Community-Wide Framework. *Int J Artif Intell Educ*. 2022 Sep 9;32(3):504–26.
40. Akgun S, Greenhow C. Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*. 2022 Aug 22;2(3):431–40.
41. Casas-Roma J, Conesa J, Caballé S. Education, Ethical Dilemmas and AI: From Ethical Design to Artificial Morality. In 2021. p. 167–82.
42. Yin RK. Case Study Research and Applications: Design and Methods [Internet]. SAGE Publications; 2017. Available from: <https://books.google.com.tr/books?id=uX1ZDwAAQBAJ>
43. Subaşı M, Okumuş K. Bir Araştırma Yöntemi Olarak Durum Çalışması. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*. 2017;21(2):419–26.
44. Gutman M. Ethical dilemmas in senior teacher educators' administrative work. *European Journal of Teacher Education*. 2018 Oct 20;41(5):591–603.
45. Capraro V, Sippel J. Gender differences in moral judgment and the evaluation of gender-specified moral agents. *Cogn Process*. 2017 Nov 9;18(4):399–405.
46. Gierczyk M, Harrison T. The Effects of Gender on the Ethical Decision-making of Teachers, Doctors and Lawyers. *The New Educational Review*. 2019 Mar 31;55(1):147–59.
47. Rothbart MK, Hanley D, Albert M. Gender differences in moral reasoning. *Sex Roles*. 1986 Dec;15(11–12):645–53.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.