

ULUSLARARASI EĞİTİM BİLİMLERİ DERGİSİ

ISSN: 2149-0848

THE JOURNAL OF INTERNATIONAL EDUCATION SCIENCE

From Beliefs to Practice:
Teachers' Roles in Education for
Sustainable Development

İnançlardan Uygulamaya:
Sürdürülebilir Kalkınma Eğitiminde
Öğretmenlerin Roller

Yeliz ÖZOĞUL*
İhsan TOPCU
Emine TUNÇER GÜNAY



Geliş/Submitted: 09.06.2026

Kabul/Accepted: 28.09.2026

 10.29228/INESJOURNAL.94843

Makale Türü:

Araştırma Makalesi

Article Information:

Research Article

Citation / Atıf

Özoğul, Y., Topçu, İ. ve Tunçer Günay, E. (2026). From beliefs to practice: Teachers' roles in education for sustainable development. *Uluslararası Eğitim Bilimleri Dergisi*, 13 (48), 275-311.

This article was checked by Intihal.net. Bu makale İntihal.net tarafından taranmıştır.

This article is under the Creative Commons license. Bu makale Creative Commons lisansı altındadır.

*Sorumlu Yazar: Sivas Cumhuriyet Üniversitesi, yeliz_ozogul@hotmail.com 

ULUSLARARASI EĞİTİM BİLİMLERİ DERGİSİ

ISSN: 2149-0848

THE JOURNAL OF INTERNATIONAL EDUCATION SCIENCE

Öz: Bu çalışmanın amacı, öğretmenlerin sürdürülebilir kalkınma eğitimi (SKE) konusundaki değer ve inançlarının eğitim süreçlerine, öğretim uygulamalarına ve öğrenci çıktılarının oluşumuna nasıl yansıdığını incelemektir. Çalışma, öğretmenlerin bilgi düzeyleri, pedagojik yönelimleri, öz-yeterlik inançları ve mesleki değerlerinin sürdürülebilir kalkınma hedeflerinin eğitim ortamlarına etkili bir şekilde entegre edilmesinde belirleyici bir rol oynadığı varsayımına dayanmaktadır. Nitel araştırma yaklaşımı kapsamında fenomenolojik desen benimsenmiş; veri toplama aracı olarak yarı yapılandırılmış görüşmeler ve açık uçlu anketler kullanılmıştır. Araştırmanın katılımcılarını, 2024-2025 eğitim-öğretim yılında Sivas ilinde ilkokul ve ortaokullarda görev yapan farklı branşlardan 18 öğretmen oluşturmuştur. Bulgular, öğretmenlerin sürdürülebilir kalkınma eğitimiye yönelik genel olarak olumlu tutumlara sahip olduklarını ve dijital içeriklerin, proje tabanlı öğrenmenin, disiplinler arası uygulamaların ve uygulamalı etkinliklerin öğrencilerin çevre bilinci ile sorumluluk duygularını geliştirmede etkili olduğunu göstermektedir. Bununla birlikte sonuçlar, öğretmenlerin uygulama kapasitelerinin toplumsal farkındalık eksikliği, altyapı yetersizlikleri ve öğretim programına ilişkin sınırlılıklar nedeniyle kısıtlandığını ortaya koymaktadır. Genel olarak çalışma, öğretmenlerin değer ve inançlarının sürdürülebilir kalkınma politikalarının sınıf içi uygulamalara dönüştürülmesinde aracılık eden bir mekanizma işlevi gördüğünü göstermektedir. Bu bağlamda bulgular, sürdürülebilir kalkınma eğitiminin uygulanmasını güçlendirmek amacıyla öğretmen eğitimi, program geliştirme ve yerel bağlamsal koşulları dikkate alan bütüncül eğitim politikalarının önemini vurgulamaktadır.

Anahtar Kelimeler: Eğitim Bilimleri, Sürdürülebilir Kalkınma, Sürdürülebilirlik Hedefleri, Sürdürülebilir Eğitim, Öğretmen İnançları, Öğretmen Öz-Yeterliği.

Abstract: The aim of this study is to examine how teachers' values and beliefs regarding education for sustainable development (ESD) are reflected in educational processes, instructional practices, and the formation of student outcomes. The study is grounded in the assumption that teachers' levels of knowledge, pedagogical orientations, self-efficacy beliefs, and professional values play a decisive role in the effective integration of sustainable development goals into educational settings. Adopting a phenomenological approach within the framework of qualitative research, the study employed semi-structured interviews and open-ended questionnaires as data collection tools. The participants of the study consisted of 18 teachers from

different subject areas working in primary and lower secondary schools in the province of Sivas during the 2024–2025 academic year. The findings indicate that teachers generally hold positive attitudes toward education for sustainable development and that the use of digital content, project-based learning, interdisciplinary practices, and hands-on activities is effective in enhancing students' environmental awareness and sense of responsibility. However, the results also reveal that teachers' implementation capacities are constrained by a lack of social awareness, infrastructural deficiencies, and curriculum-related limitations. Overall, the study demonstrates that teachers' values and beliefs function as a mediating mechanism in translating sustainable development policies into classroom practices. In this regard, the findings underscore the importance of holistic educational policies that take into account teacher education, curriculum development, and local contextual conditions in order to strengthen the implementation of education for sustainable development.

Keywords: Education Sciences, Sustainable Development, Sustainability Goals, Sustainable Education, Teacher Beliefs, Teacher Self-Efficacy.

Introduction

Sustainable development has emerged as a central global paradigm aimed at addressing interrelated environmental, economic, and social challenges while safeguarding the needs of future generations. Beyond economic growth, the concept emphasizes the improvement of overall quality of life through responsible resource use, social equity, and environmental protection. Within this framework, education is widely recognized as a key mechanism for fostering sustainable societies. Education for sustainable development (ESD) seeks to cultivate individuals who are capable of critical thinking, ethical reasoning, and informed decision-making, enabling them to adopt responsible and sustainable lifestyles. By integrating sustainability principles into learning processes, education contributes not only to individual development but also to long-term societal transformation.

In this process, teachers occupy a pivotal position as primary agents who mediate sustainability values, knowledge, and practices within educational settings. Teachers' beliefs, values, and pedagogical orientations significantly shape how sustainability concepts are interpreted, prioritized, and translated into classroom practices. Their professional dispositions influence students' environmental awareness, social responsibility, and commitment to sustainable ways of living. Consequently, the effectiveness of education for sustainable development is closely linked to teachers' internalization of sustainability principles and their capacity to model these values through instruction and interaction. As emphasized in international policy frameworks, strengthening teachers' competencies and belief systems is therefore essential for

embedding sustainability meaningfully and consistently across educational contexts.

Education for Sustainable Development (ESD) has emerged as a central pillar of global education policy, particularly following the adoption of the 2030 Agenda for Sustainable Development. UNESCO conceptualizes ESD as an educational approach that enables learners to acquire the knowledge, skills, values, and attitudes necessary to contribute to sustainable societies (UNESCO, 2017). Within this framework, education is positioned not merely as a mechanism for knowledge transmission but as a transformative process that fosters critical thinking, ethical responsibility, and active citizenship aligned with the Sustainable Development Goals (SDGs). In particular, SDG 4 emphasizes the role of quality education in promoting sustainable lifestyles, human rights, gender equality, and global citizenship, underscoring the integrative and normative dimensions of sustainability-oriented education (UNESCO, 2015). Teachers' levels of awareness and their implementation skills regarding sustainable development are decisive factors in achieving the intended outcomes of education. Therefore, an in-depth examination of teachers' values and beliefs is of great importance for understanding how sustainable development goals can be supported through education. The core dimensions and subfields of sustainable development are quite broad and comprehensive. Figure 1 presents these in detail.



Figure 1. Core Dimensions and Subdomains of Sustainable Development (ConceptDraw, 2019)

Sustainable Development

Sustainable development is conceptualized as a comprehensive development model that seeks to balance environmental protection, economic growth, and social equity in an integrated and interdependent manner. Its primary objective is to ensure that natural resources are used responsibly while meeting current human needs and safeguarding the capacity of future generations to meet their own. This understanding was formally articulated in the Brundtland Report published by the World Commission on Environment and Development, which defined sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). This definition underscores the tripartite structure of sustainable development by emphasizing the inseparability of environmental sustainability, economic viability, and social justice.

Beyond its environmental dimension, sustainable development constitutes a normative framework aimed at fostering more equitable, inclusive, and resilient societies. It encompasses the promotion of social justice, equal access to education and health services, and the expansion of economic opportunities in ways that reduce structural inequalities. From this perspective, sustainable development is not merely a conservation-oriented approach but a holistic process in which environmental, social, and economic goals are addressed simultaneously and mutually reinforced. Contemporary policy and academic literature increasingly stress that neglecting any one of these dimensions undermines long-term sustainability outcomes, highlighting the necessity of integrated strategies that align human well-being with ecological limits (Sachs, 2015).

The primary objective of sustainable development is to promote economic growth while preserving environmental integrity and enhancing overall quality of life. In this context, education for sustainable development (ESD) seeks to equip individuals with the cognitive, ethical, and practical capacities necessary to balance economic, environmental, and social considerations. Education is thus conceptualized not merely as a mechanism for knowledge transmission but as a transformative process that fosters awareness of environmental stewardship and social responsibility. Achieving sustainable development goals requires countries to adopt comprehensive policy frameworks that simultaneously address ecological challenges, economic inequalities, and social well-being. These integrated efforts aim to mobilize individuals across diverse age groups and social backgrounds to actively contribute to social, economic, and environmental sustainability at both local and global levels.

The influence of sustainable development goals on education extends beyond shaping individuals’ values and responsibilities and necessitates the adoption of innovative pedagogical approaches. Contemporary educational models, particularly

constructivist learning frameworks, play a crucial role in supporting sustainability-oriented learning by emphasizing learner agency, critical reflection, and real-life problem solving. Within this framework, teachers assume an enhanced guiding role, facilitating students' engagement with sustainability-related issues rather than delivering predefined content. Teachers' self-efficacy beliefs and professional competencies in sustainability education significantly affect the extent to which these goals are effectively implemented in classroom practices. Accordingly, strengthening teachers' pedagogical capacities and confidence is widely recognized as a prerequisite for the successful integration of sustainability principles into educational systems (UNESCO, 2017).

In contemporary education systems, teachers' beliefs and values exert a profound influence on students throughout the educational process. The constructivist approach is one of the modern educational approaches that particularly aims to develop students' creative and critical thinking skills. In this approach, teachers assume a guiding role in the learning process, while students actively participate in the construction of knowledge. In this process, teachers' self-efficacy beliefs are of great importance. "Self-efficacy refers to a teacher's belief in their ability to successfully perform a specific task or responsibility. Teachers with high self-efficacy beliefs tend to be more open to innovative methods in the instructional process and are able to support students' development more effectively" (Güven & Genç, 2024, pp. 363–388).

A growing body of international research highlights that the effectiveness of ESD largely depends on teachers' beliefs, values, and pedagogical orientations. Teachers' personal value systems and professional belief structures shape how sustainability concepts are interpreted, prioritized, and enacted in classroom practices (Borg, Gericke, Höglund, & Bergman, 2012). Studies indicate that teachers who perceive sustainability as a moral and social responsibility are more likely to integrate ESD holistically into their teaching, whereas those with fragmented or instrumental understandings tend to address sustainability in a superficial or episodic manner (Kopnina, 2020). Consequently, teachers' beliefs function as a mediating mechanism between policy-level sustainability goals and classroom-level instructional practices.

Teachers with strong self-efficacy beliefs contribute not only to students' academic achievement but also to their social and emotional development. Such teachers tend to adopt flexible, student-centered, and adaptive instructional strategies that enable them to respond effectively to learners' diverse needs. High levels of self-efficacy are associated with a solution-oriented professional stance, allowing teachers to persist in the face of instructional challenges and to maintain students' motivation for learning. This pedagogical orientation supports the development of students' self-directed and autonomous learning skills, which constitute a core principle of constructivist

educational approaches. From a social cognitive perspective, teachers' beliefs about their capabilities critically shape their instructional choices and classroom practices (Bandura, 1997).

Sustainable development, understood as an integrated process encompassing environmental, economic, and social dimensions, places education at its conceptual and practical core. Education enables individuals to acquire the knowledge, skills, and dispositions necessary to engage meaningfully with sustainability challenges and to contribute to long-term societal well-being. Within this framework, teachers' knowledge, awareness, and beliefs regarding sustainable development are critical determinants of effective implementation. Teachers who possess a strong sense of efficacy and a clear understanding of sustainability principles are more likely to integrate these values into their pedagogical practices, thereby fostering students' awareness and capacity to act responsibly in relation to sustainable development goals. Consequently, strengthening teachers' self-efficacy and sustainability-related competencies emerges as a central requirement for advancing education for sustainable development.

In Türkiye, education for sustainable development has been integrated into the Science curriculum since 2013, and efforts have been made to enhance teachers' competencies in this field (Şeker & Aydın, 2021). However, it is observed that there is a lack of sufficient research on teachers' beliefs and levels of practice regarding sustainable development. Therefore, further research on this topic is needed. This is because the effective implementation of education for sustainable development is not limited to curriculum reforms alone; it is also directly related to the pedagogical approaches adopted by teachers. In this process, the constructivist approach offers an important opportunity to enable students to adopt a critical perspective toward environmental and social issues. Teachers' ability to relate sustainable development goals to students' daily lives makes it possible for the subject to have a more lasting impact on students. In addition, expanding in-service training programs for teachers on sustainable development topics may accelerate progress toward these goals.

Türkiye represents a particularly significant context for examining education for sustainable development due to its centralized curriculum structure, regionally differentiated educational infrastructure, and ongoing efforts to align national education policies with global sustainability agendas. While sustainability-related objectives are formally embedded within national curricula, discrepancies between policy intentions and classroom-level practices persist, often shaped by local socioeconomic conditions and institutional constraints (ERG, 2022). Investigating teachers' lived experiences within this context provides critical insight into how global sustainability discourses are translated, adapted, or constrained at the local level.

The relationship between education and philosophy directly influences the educational process while shaping individuals' value judgments and belief systems. Educational philosophies determine the methods and approaches adopted by teachers in teaching. While traditional approaches such as perennialism and essentialism emphasize the transmission of knowledge by the teacher, contemporary approaches such as progressivism and reconstructionism focus on student-centered and active learning methods. Teachers' educational philosophies have a significant impact on their instructional practices. In this context, teachers' beliefs regarding sustainable development goals determine how effectively they will play a role in education (Eğmir et al., 2021).

Teachers' educational philosophies play a decisive role in shaping their orientations toward the sustainable development goals and the pedagogical strategies they adopt in this context. Teachers who align with a progressivist educational philosophy tend to emphasize experiential learning, problem solving, creative thinking, and collaborative practices, thereby enabling students to actively engage with sustainability-related challenges and real-world problems. This approach is closely associated with learner-centered and constructivist traditions, which prioritize inquiry, reflection, and active participation in the learning process (Dewey, 1938).

By contrast, teachers who adopt more traditional educational philosophies, such as perennialism, are more likely to foreground the theoretical foundations, canonical knowledge, and conceptual dimensions of sustainable development. While this orientation may support students' conceptual understanding of sustainability principles, it may offer more limited opportunities for experiential engagement and critical application. These philosophical differences directly shape how education for sustainable development is enacted in classroom practice and influence students' levels of awareness, critical understanding, and skill acquisition in relation to sustainability. Accordingly, a systematic examination of the relationship between teachers' educational philosophies and sustainable development is essential for the development of pedagogical strategies that are both theoretically grounded and educationally effective.

One of the most fundamental tools for achieving sustainable development goals is quality education. Quality education enables the development of individuals who can contribute to sustainable development by enhancing their knowledge, skills, and social values. UNESCO has emphasized quality education as one of the 17 core sustainable development goals (UNESCO, 2015). In Türkiye, the Ministry of National Education implements various projects at both national and international levels for this purpose. However, it has been noted that these projects need to be expanded and diversified (Provincial Directorate of National Education of Batman, 2018). Although education related to sustainable development is generally associated with environmental and

economic dimensions, it should be noted that quality education is addressed in a limited manner within this context.

Achieving the sustainable development goals requires a conception of quality education that extends beyond improving academic achievement to addressing structural social inequalities. Within this framework, quality education is expected to foster awareness of core social values such as justice, equality, and human rights, while simultaneously promoting sensitivity to environmental and economic challenges. Education for sustainable development emphasizes the cultivation of informed, responsible, and ethically grounded individuals who are capable of contributing to social transformation. In this respect, the awareness and competencies of teachers and educators play a critical role, as they mediate sustainability-related values and perspectives within educational contexts. For this understanding to produce broader and more effective outcomes, instructional materials and curricula must be systematically reorganized in alignment with sustainable development principles (UNESCO, 2017).

Education for sustainable development not only promotes environmental consciousness but also aims to equip individuals with the knowledge, skills, and dispositions necessary to advance social justice, economic equity, and sustainable lifestyles. In this process, teachers' beliefs, values, and professional orientations emerge as key determinants of students' engagement with and attainment of sustainable development goals. Teachers' educational philosophies, self-efficacy beliefs, and attitudes toward sustainability-oriented education directly influence the effectiveness of classroom practices and learning outcomes. Accordingly, strengthening teachers' knowledge base and pedagogical competencies in education for sustainable development is essential. Within this context, the present study seeks to illuminate teachers' roles in achieving sustainable development goals by examining both the challenges they encounter and the strategies they employ, thereby contributing to the enhancement of educational quality and providing guidance for future education policy development.

This study aims to systematically examine teachers' values and beliefs regarding education for sustainable development (ESD) and to analyze how these orientations are reflected in instructional processes and student-related outcomes. The primary purpose of the research is to provide a comprehensive understanding of teachers' sustainability-related belief systems and to investigate the ways in which these beliefs shape pedagogical practices, instructional strategies, and learning environments. In this context, the study explores how teachers' values and beliefs influence the integration of sustainable development principles into teaching methods, curriculum implementation, and students' attitudes toward sustainability. Furthermore, teachers' levels of

knowledge, awareness, and attitudes toward sustainable development goals are examined in relation to their effectiveness in embedding these goals within educational content and classroom practices.

Building on this framework, the research focuses on teachers' perceptions, experiences, and day-to-day practices in education for sustainable development in order to elucidate their impact on student outcomes. Particular attention is given to the extent to which teachers' values and beliefs facilitate or constrain the implementation of sustainable development goals in educational settings. Within this scope, the study also seeks to identify the opportunities and challenges teachers encounter while translating sustainability-oriented goals into classroom instruction and learning processes. By addressing these dimensions, the research aims to contribute to a deeper understanding of the pedagogical conditions under which education for sustainable development can be implemented more effectively and sustainably.

Despite the growing international emphasis on teachers' roles in education for sustainable development, research conducted within the Turkish educational context remains limited, particularly in terms of qualitative, experience-based inquiry. Existing studies in Türkiye predominantly focus on teachers' attitudes or awareness levels through quantitative survey designs, offering valuable but surface-level insights into ESD implementation (Korkmaz, 2020; Şeker & Aydın, 2021). However, there is a notable lack of phenomenological research that explores how teachers' values and beliefs are constructed through lived experience and how these internalized orientations are reflected in daily instructional practices. Therefore, there is a clear need for in-depth qualitative studies that foreground teachers' voices and experiential meanings in order to better understand the complexities of ESD implementation within Türkiye's centralized curriculum structure, regionally uneven educational resources, and context-specific sociocultural conditions.

Problem Statement

How do teachers integrate their beliefs and values regarding sustainable development goals into educational processes, and what knowledge gaps affect this process?

In this study, the sub-problems were structured to examine teachers' experiences with education for sustainable development within a coherent and integrated analytical framework. The sub-problems follow a sequential logic that begins with teachers' personal experiences, continues with the challenges encountered during implementation, and proceeds to teachers' beliefs and attitudes toward education for sustainable development. This is followed by an examination of the instructional methods and techniques shaped by these beliefs, and finally, teachers' levels of

knowledge and their capacity to translate this knowledge into practice. This analytical sequence enables a holistic exploration of teachers' experiences by capturing the interrelated individual, pedagogical, and contextual dimensions of education for sustainable development.

Sub-Problems

As sub-problems of the study, answers will be sought to the following questions:

How do teachers describe their personal experiences with education for sustainable development, and what types of practices do they implement in this regard?

What obstacles do teachers encounter during education for sustainable development, and what solution strategies do they develop to address these obstacles?

What are the beliefs and attitudes of teachers from different subject areas toward education for sustainable development?

How do the methods and techniques used in education for sustainable development affect the frequency with which teachers use these methods?

What are teachers' levels of knowledge regarding education for sustainable development, and what is their capacity to put this knowledge into practice?

Method

Research Design

In this study, a phenomenological research design was adopted. Phenomenology is a qualitative research approach that seeks to understand how individuals develop perceptions of their lived experiences and the meanings they attribute to those experiences. In this context, the study aims to explore in depth the participants' individual experiences with education for sustainable development and the meanings they attribute to these experiences. In line with the aims of this study, a descriptive phenomenological approach was adopted in order to explore teachers' lived experiences with education for sustainable development as they are consciously perceived and articulated. Descriptive phenomenology seeks to identify the essential meanings of a phenomenon by focusing on participants' direct experiences, while minimizing theoretical imposition and prior assumptions (Wilson, 2015). This approach is particularly suitable for the present study, as it allows for an in-depth examination of how teachers experience, interpret, and enact education for sustainable development within their everyday professional practices.

To enhance methodological rigor, the researcher employed bracketing as a key phenomenological strategy throughout the research process. Bracketing involves the conscious identification and temporary suspension of the researcher's prior

assumptions, professional background, and value judgments related to the phenomenon under investigation (Wilson, 2015). In this study, reflexive awareness was maintained through continuous attention to how the researcher's academic background and professional experiences might influence data interpretation. This reflexive stance supported a more transparent and disciplined engagement with participants' accounts, allowing meanings to emerge from the data rather than being imposed by the researcher.

The use of a phenomenological research design to examine teachers' values and beliefs regarding education for sustainable development provides a robust methodological framework for capturing participants' lived experiences and the meanings they attribute to these experiences. Phenomenology enables the researcher to move beyond surface-level descriptions and to explore how teachers cognitively and emotionally interpret sustainability-related concepts within their professional lives. Through this approach, teachers' pre-existing beliefs, value orientations, and personal interpretations of education for sustainable development can be examined in depth, allowing for a nuanced understanding of how these internal frameworks shape instructional practices and professional decision-making. Data collection methods such as in-depth interviews and open-ended questioning are particularly suited to this design, as they facilitate rich, reflective accounts of participants' experiences.

In line with this methodological orientation, semi-structured interviews were employed in the present study to gain an in-depth understanding of teachers' perceptions, beliefs, values, and emotional responses related to education for sustainable development. The research aimed to identify teachers' experiences with sustainability-oriented education, the challenges they encountered in educational settings, and the belief systems they developed throughout this process. Interview questions were carefully designed to elicit detailed narratives concerning participants' personal experiences and instructional practices, thereby enabling a comprehensive exploration of the phenomenon under investigation. Throughout the research process, the analytical steps proposed by Wilson (2015) were systematically followed in order to ensure methodological rigor and coherence in the analysis of phenomenological data.

Table 1

Steps of Phenomenological Research

Comprehensive Sense of Meaning	People naturally tend to experience their world as meaningful. Meaning is embedded in emotions, practices, and cognition.
Person and World	To what extent can a person's lived experience be examined objectively? Are you even aware of your own assumptions and biases?

Points Regarding the Continuity of Lived Experience	Some hidden knowledge may never be revealed; however, the knowledge we can access by focusing on thoughts, feelings, and practices is both describable and interpretable.
Benefits of Phenomenology	Phenomenology reveals and explains the deeper human dimensions of a situation and is concerned with mood, feelings, and emotions. This enhanced understanding can empower both practitioners and service users.
Core Components of Phenomenological Research	A curiosity-driven research question informs the design of a study. Participants must be interested in and committed to exploring their lived experiences, which helps generate high-quality data. An effective analytical framework can enhance the quality of analysis.
Clues from the Literature	Phenomenology focuses on a specific experience or the object of a person's perception rather than on individual biographies, social norms, or attitudes. Commonly used key terms include bracketing, essence, and lived experience.
Limitations	Phenomenological research cannot generate theory. It requires a high level of personal engagement from everyone involved, and trust may be a limiting factor.

Source: (Wilson, 2015)

Participants

The participants of the study are teachers working in primary and secondary education. The population of the research consists of all teachers working in primary and secondary schools in the province of Sivas during the 2024–2025 academic year. The participants of the study comprise a total of 18 teachers working in these schools: two Religious Culture and Ethics teachers, one Science teacher, two Visual Arts teachers, one English teacher, two Mathematics teachers, one Music teacher, one Guidance and Psychological Counseling teacher, five classroom teachers, two Social Studies teachers, and two Turkish language teachers.

The participants were selected using a purposive sampling strategy, which is commonly employed in qualitative research to obtain rich and information-dense data relevant to the research phenomenon. More specifically, maximum variation sampling was adopted in order to capture a wide range of perspectives related to education for sustainable development across different subject areas, levels of teaching experience, and educational backgrounds. This strategy enabled the inclusion of teachers from diverse disciplines, thereby allowing the study to reflect varied pedagogical orientations and experiential interpretations of sustainability education.

The study was conducted in the province of Sivas, which was selected based on considerations of contextual relevance and accessibility. Sivas represents a context

where centralized curriculum policies intersect with regionally differentiated educational resources and socio-cultural conditions. Examining teachers' experiences within this setting provided an opportunity to explore how education for sustainable development is interpreted and enacted in a non-metropolitan context, thereby contributing to a more nuanced understanding of context-sensitive implementation processes. Detailed demographic information about the participants is presented in Table 2.

Table 2
Participants

Participants	Gender	Teaching Field	Years of Experience	Educational Background
K1	Female	Religious Culture and Ethics	6 – 10	Bachelor's Degree
K2	Male	Religious Culture and Ethics	16 – 20	Master's Degree
K3	Female	Science	1 – 5	Bachelor's Degree
K4	Male	Visual Arts	11 – 15	Bachelor's Degree
K5	Female	Visual Arts	1 – 5	Bachelor's Degree
K6	Female	English	21 – 25	Master's Degree
K7	Female	Mathematics	11 – 15	Bachelor's Degree
K8	Female	Mathematics	6 – 10	Bachelor's Degree
K9	Male	Music	1 – 5	Bachelor's Degree
K10	Female	Psychological Counseling and Guidance	1 - 5	Graduate Degree (Master's–Doctorate)
K11	Female	Primary School Teacher	11 – 15	Bachelor's Degree
K12	Male	Primary School Teacher	26 +	Bachelor's Degree
K13	Male	Primary School Teacher	16- 20	Graduate Degree (Master's–Doctorate)

K14	Female	Primary School Teacher	16- 20	Graduate Degree (Master's– Doctorate)
K15	Female	Primary School Teacher	6 – 10	Bachelor's Degree
K16	Male	Social Studies	11 – 15	Bachelor's Degree
K17	Male	Turkish Language	21 – 25	Master's Degree
K18	Female	Turkish Language	11- 15	Graduate Degree (Master's– Doctorate)

Data Collection and Analysis

During the data collection process, a semi-structured interview form was employed to enable participants to articulate their experiences related to education for sustainable development in a detailed and reflective manner. This approach provided sufficient flexibility for participants to express their individual perceptions, interpretations, and meaning-making processes, while also ensuring alignment with the research objectives. Data were collected through in-depth interviews and an open-ended questionnaire administered to teachers. These data collection tools were designed to elicit comprehensive information regarding teachers' values, beliefs, and lived experiences associated with education for sustainable development. Through this process, insights were gathered into how teachers conceptualize sustainable development, the instructional practices they implement, and the ways in which sustainability-related principles are integrated into educational settings. Furthermore, particular attention was given to examining how teachers' educational beliefs concerning sustainable development influence their instructional choices and professional development processes.

Data analysis was conducted in accordance with a phenomenological analytical framework, with the aim of uncovering the essence of participants' lived experiences. Interview transcripts and questionnaire responses were examined systematically and organized into meaningful units and themes that reflected participants' shared and divergent experiences. The analysis focused on identifying recurrent patterns, similarities, and differences in teachers' perceptions, beliefs, and values related to education for sustainable development. In this process, descriptive analysis was used to present participants' experiences in a coherent and structured manner, while content

analysis was employed to deepen the interpretation of emerging themes. This combined analytical strategy allowed for an in-depth exploration of the meanings participants attributed to their experiences, in line with the core principles of phenomenological inquiry.

Interpretation of the Findings

The findings obtained may constitute an important resource for understanding teachers' values and beliefs regarding education for sustainable development. These results can contribute to the development of educational policies and teacher education programs. In addition, suggestions were offered to help teachers develop a more informed and conscious approach to education for sustainable development. This phenomenological approach is an effective method for gaining an in-depth understanding of teachers' values and beliefs and for revealing how these beliefs influence the educational process.

Credibility and Transferability

One of the most important elements of education for sustainable development is the reflection of teachers' values and beliefs in the educational process. Teachers are figures who directly influence students' educational lives. Therefore, teachers' beliefs shape not only their own instructional styles but also students' perspectives, behaviors, and sense of social responsibility. Teachers' beliefs regarding sustainable development form the foundation of the education they provide in this area. If a teacher has internalized the importance of sustainable development and holds strong beliefs about it, these beliefs are reflected in the classroom and transmitted to students. Students' ability to connect with their teachers' beliefs is directly related to the transferability of these beliefs. Credibility was enhanced through the use of direct quotations drawn from participants' narratives, allowing teachers' voices to be represented authentically and transparently. Verbatim excerpts were used to illustrate emerging themes and to demonstrate a clear link between the data and the interpretations presented. This approach supported the plausibility of the findings by enabling readers to trace analytical claims back to participants' lived experiences.

Education for sustainable development is not limited to the transmission of academic knowledge. It also involves teachers' responsibility to foster students as conscious, responsible, and environmentally friendly individuals. The transferability of teachers' values depends on their ability to support their beliefs with concrete examples and practices. At this point, teachers' attitudes and practices in education serve as a fundamental tool for enabling students to internalize these values. In this context, the belief that the knowledge and strategies learned in one's personal development journey should be transferable not only to oneself but also to others can serve as an illustrative

example. By providing education in a manner consistent with their own beliefs, teachers enable students to learn these values and apply them in their own lives. Transferability was addressed through the provision of thick contextual description, including detailed information about the research setting, participant characteristics, and institutional conditions. By explicitly situating the study within the educational context of Sivas province, the research enables readers to assess the applicability of the findings to similar educational settings with comparable socio-cultural and institutional features.

Consistency and Confirmability

Consistency is a critical factor in achieving sustainable development goals in education. The consistent integration of teachers' values and beliefs regarding sustainable development into instructional practice enhances the effectiveness of the educational process. When a teacher consistently applies teaching methods that serve sustainable development goals in every lesson and activity, students are more likely to adopt this approach. In this way, sustainable development ceases to be merely a subject of instruction and becomes a daily value in students' lives. Consistency refers to the continuous structuring of lesson plans, activities, and assessment methods in accordance with a sustainable development perspective. Such an approach strengthens both students' academic achievement and their social awareness.

Along with consistency, confirmability is also of great importance. Every intervention carried out in education for sustainable development indicates that teachers' values and beliefs should be verifiable based on concrete evidence. Verifying the appropriateness of the pedagogical methods used by teachers is necessary in order to evaluate the effects of education provided for sustainable development. Confirmability means that teachers' practices should not rely solely on a theoretical foundation but should also be supported by tangible outcomes obtained in practice. In this sense, individuals' efforts to validate the strategies, values, and beliefs they apply in their own lives while pursuing their goals can serve as an example for teachers in educational contexts. In other words, educational practices implemented for sustainable development should be validated not only by teachers' beliefs but also by the accuracy and effectiveness of these beliefs. This ensures continuous improvement in the educational process and enables students to benefit from it in the most effective way. Confirmability was ensured by maintaining a clear distinction between empirical data and interpretive commentary throughout the analysis process. Analytical decisions were grounded in participants' accounts rather than the researcher's personal assumptions, and interpretations were consistently supported by evidence derived directly from the data. This strategy contributed to the transparency and neutrality of the analytical process.

Given the phenomenological nature of the study, reflexivity constituted a central

component of methodological rigor. The researcher's academic background and professional experience in the field of education were acknowledged as both a resource and a potential source of interpretive bias. To address this, continuous reflexive awareness was maintained throughout data collection and analysis, with particular attention paid to how prior knowledge and assumptions might shape interpretive decisions. This reflexive stance supported a disciplined engagement with the data and strengthened the trustworthiness of the findings. The researcher's familiarity with educational practices and sustainability-related concepts was treated as an analytical asset while simultaneously requiring careful management to minimize potential subjective influence. This balance was addressed through continuous reflexive awareness and a systematic commitment to grounding interpretations in participants' accounts rather than in the researcher's prior assumptions.

Findings

In this section, the findings obtained from the study are presented in line with the sub-problems. Teachers' views on education for sustainable development, their personal experiences, the obstacles they encountered, and the solution strategies they developed in response to these obstacles are presented under separate headings.

Teachers' Views on Education for Sustainable Development

The main theme identified as education for sustainable development and teachers is presented below in Table 3 in terms of codes, frequencies, and recurring participants.

Table 3

Teachers' Views on Education for Sustainable Development

Theme	Sub-theme	Code	Participant Code	f
Education for Sustainable Development and Teachers	Teachers' personal experiences and practices	Knowledge transfer to new generations in education	K1, K2, K3, K4, K5	5
		Digital content and applications	K6, K7, K8, K9, K10	5
		Recycling projects and interdisciplinary practices	K11, K12, K13, K14, K15	5
	Teachers' challenges and solution strategies	Students' reluctance and lack of social awareness	K16, K17, K18	3
		Students' reluctance and lack of social awareness	K1, K2, K3, K4, K5	5
		Educational infrastructure deficiencies and socio-cultural	K6, K7, K8, K9, K10	5

	barriers		
Teachers' beliefs and attitudes	Teachers' perception of the importance of this education	K11, K12, K13, K14, K15	4
	Curriculum change related to education for sustainable development	K11, K12, K13, K14	3
	Promoting environmental awareness and behavioral change	K14, K15, K16, K17	4
Methods and techniques used in education for sustainable development	Digital content and educational technologies	K6, K7, K8, K9, K10	5
	Hands-on activities and projects	K11, K12, K13, K14, K15	5
	Interdisciplinary studies and group work	K16, K17, K18	3
Teachers' knowledge level and implementation capacity	Knowledge transfer to new generations in education	K1, K2, K3, K4, K5	5
	Applicability of in-class and out-of-class activities	K6, K7, K8, K9, K10	5

Teachers are observed to have diverse experiences in terms of both their individual levels of knowledge and their classroom practices related to education for sustainable development.

Some participants expressed this situation as follows:

"I understand sustainable development as teaching it to new generations as a subject within educational sciences. Having knowledge about this and possessing the competence to implement it will lead to profound changes in our lives. It will create emotional, physical, social, and cultural changes." (K3)

"It means making long-term investments in education and receiving returns on those investments. It also means understanding the importance of investments in education and making greater efforts to take an active role in the educational process accordingly." (K4)

Participants identified social awareness deficiencies, inadequacies in educational infrastructure, and limitations in implementation settings as the main obstacles.

Some participants described this as follows:

"Recycling practices remain very limited. Children can do this either individually or in the school environment, but they cannot continue it afterward. For such habits to become permanent, families should also receive training, and local governments should increase the number of recycling bins." (K7)

"The low cultural level of society creates problems in maintaining the continuity of the education provided. We encounter obstacles such as inadequate infrastructure at the local level." (K5)

The majority of participants demonstrate positive attitudes toward education for sustainable development and argue that this education should be integrated into the curriculum.

Some participants expressed this as follows:

"Of course it should be included. For limited resources and material assets to meet people's needs over many years, new generations must be conscious." (K6)

"Yes, it definitely should be included. Raising children's awareness and ensuring that they are environmentally sensitive is important for a more livable future." (K11)

Teachers employ a variety of methods and techniques, diversifying them across both digital and practical domains.

Some participants expressed this as follows:

"I try to implement interdisciplinary teaching. I convey topics such as tree planting, environmental cleanliness, and the conscious use of energy resources to children through instruction and research-based teaching." (K10)

"I use methods such as drama, question-answer, and brainstorming. Students' decision-making skills and scientific thinking abilities have developed." (K12)

According to the findings obtained in the study, teachers demonstrate not only theoretical knowledge but also practical implementation skills.

Some participants expressed this situation as follows:

"I make use of digital content. Whenever I have the opportunity, I participate in trainings offered on this topic. In this way, I have learned more and my competencies have improved." (K8)

"I try to use classical methods together with contemporary teaching methods and techniques as much as classroom conditions and students' levels allow." (K9)

Participants believe that this education will contribute to environmental awareness, economic stability, and social harmony in the long term.

Some participants expressed this as follows:

"It can reduce environmental pollution and unnecessary overconsumption. It can ensure the continuous development of society in harmony with nature, as well as the continuity of happiness and well-being." (P14)

“By setting an example through behaviors, it can create awareness and also change other people’s perspectives on this issue.” (K15)

Teachers’ Personal Experiences and Practices Related to Education for Sustainable Development

Information regarding teachers’ personal experiences and practices related to education for sustainable development is presented in Table 4.

Table 4

Teachers’ Views on Their Personal Experiences and Practices

Theme	Sub-theme	Code	Participant Code	f
Teachers’ Personal Experiences and Practices	Awareness of Education for Sustainable Development	Knowledge transfer to new generations in education	K1, K2, K3, K4, K5	5
	Applied Teaching Techniques	Digital content and applications	K6, K7, K8, K9, K10	5
	Methods for Education for Sustainable Development	Recycling projects and interdisciplinary practices	K11, K12, K13, K14, K15	5

The findings reveal that teachers employ a variety of instructional methods and illustrate how these methods function in transferring awareness of sustainable development to students. According to participants’ statements, active learning techniques such as the use of digital content, group work, brainstorming, and drama are effective in enhancing students’ scientific thinking, decision-making skills, and academic achievement.

“When concepts are explained to students through animations and videos, they understand them much better. They prepare their own projects.” (K6)

“Simply explaining is not enough. When I use hands-on content, students’ participation is much higher.” (K8)

Teachers also emphasized the importance of serving as role models in this process and stated that their own behaviors have a decisive impact on students.

“If we have gained this awareness, we must pass it on to children. The future belongs to them, and if we do not educate them properly, they will repeat the same mistakes.” (K1)

"Education for sustainability should be lived not only in lessons but throughout the entire school culture. The new generation should grow up with this awareness." (K3)

This approach contributes to raising students as conscious and sensitive individuals with regard to sustainability. In addition, teachers stated that they implement practices such as projects and recycling activities in their classrooms in order to foster environmental awareness. This situation contributes to students becoming individuals who carry a sense of social responsibility.

"Every year, we prepare an exhibition using waste materials as a class. They both have fun and develop environmental awareness." (K11)

"By combining science and visual arts, we show children that waste can be transformed into art." (K12)

"In mathematics lessons, we analyze waste statistics, and in Turkish lessons, we have students design posters. We can structure every subject in line with this purpose." (K14)

Teachers' experiences with education for sustainable development have the potential to create positive changes at the societal level by shaping students' lifestyles and environmental sensitivity.

3.1.2. Barriers Encountered by Teachers During Education for Sustainable Development and the Solution Strategies They Develop

Information regarding the barriers teachers encounter during education for sustainable development and the solution strategies they develop in response to these barriers is presented in Table 5.

Table 5

Barriers Encountered by Teachers and Their Solution Strategies

Theme	Sub-theme	Code	Participant Code	f
Challenges Faced by Teachers and Solution Strategies	Out-of-class barriers	Students' reluctance and lack of social awareness	K16, K17, K18	3
	Structural and cultural barriers	Educational infrastructure deficiencies and socio-cultural barriers	K1, K2, K3, K4, K5	5
	Solution strategies	Increasing hands-on activities in education	K6, K7, K8, K9, K10	5

Teachers state that deficiencies in social awareness constitute one of the greatest barriers in education. According to the participants, this situation is related to the fact that people do not attach sufficient importance to sustainable development and that society develops awareness of this issue at a late stage.

“The importance of this issue has not yet been adequately understood in society. This reduces students’ interest in the lesson.” (K16)

“Parents are unfamiliar with these concepts. When there is no family support, students are also not motivated.” (K18)

In addition, the low cultural level of society and deficiencies in educational infrastructure hinder the continuity of education for sustainable development. Problems encountered at the local level include inadequacies in school buildings, overcrowded classrooms, and a lack of materials.

“Our school does not have digital tools to present environmental content. We cannot provide visual support.” (K2)

“In many village schools, there are not even recycling bins, so children are not introduced to these concepts at all.” (K3)

As long as society’s perspective on sustainability does not change, education will remain incomplete (K5).

Another challenge encountered in education is students’ initial reluctance and the uncertainty regarding how education for sustainable development affects their daily lives. Teachers report that students are initially hesitant toward such instruction; however, their attitudes tend to change positively once they begin to observe tangible outcomes throughout the process.

“At first, they were very uninterested, but as we carried out small projects in the classroom, they began to take ownership.” (K17)

“Unless we show them the direct benefits, sustainability feels like a very distant concept to them.” (K16)

To overcome these barriers, teachers emphasize the need to increase hands-on activities. Interactive methods are reported to both motivate students to participate actively in the process and help concretize abstract concepts.

“When we address environmental issues through drama and role-playing activities, children are much more affected.” (K7)

“When we use practical applications, children both enjoy the process and retain the message more permanently.” (K9)

Among the proposed solution strategies, teachers highlight the importance of involving families and local administrations in the process, increasing awareness-raising activities, expanding the availability of recycling bins, and systematically integrating education for sustainable development into the curriculum. Through these measures, it is aimed to overcome the barriers to sustainable development education and to establish lasting awareness within society.

"Not only schools, but the entire neighborhood and municipalities should be involved in this process." (K6)

"We would like to see recycling bins not only in schools but in every neighborhood." (K8)

Teachers' Beliefs and Attitudes Toward Education for Sustainable Development

Information regarding teachers' beliefs and attitudes toward education for sustainable development is presented in Table 6.

Table 6

Teachers' Beliefs and Attitudes

Theme	Sub-theme	Code	Participant Code	f
Teachers' Beliefs and Attitudes	The necessity of sustainable development in education	Teachers' perception of the importance of this education	K11, K12, K13, K14, K15	4
	Curriculum change in education	Curriculum change related to education for sustainable development	K11, K12, K13, K14	3
	Raising children's awareness	Promoting environmental awareness and behavioral change	K14, K15, K16, K17	4

The findings reveal the beliefs and attitudes of teachers from different subject areas toward education for sustainable development. Teachers state that this type of education contributes to the development of a more sensitive and responsible society by increasing individuals' environmental, economic, and social awareness. In particular, the view that education for sustainable development represents an investment in the future is widely shared.

“Education for sustainable development enables us to produce solutions not only for today’s problems but also for the challenges of the future.” (K11)

“Our students become more sensitive to nature and resources through this education.” (K13)

Teachers believe that this education will transform individuals’ consumption habits, contribute to more efficient use of resources, and help prevent waste.

“We teach children thrift and avoiding waste at an early age. This becomes permanent in their lives.” (K15)

In addition, teachers emphasize the importance of including sustainable development more strongly in the school curriculum. They point out that the current curriculum addresses this topic rather superficially and argue that it should be handled in a more comprehensive and systematic manner.

“Sustainability is addressed very superficially in the curriculum. A separate course should be allocated to this topic.” (K12)

“It would be more effective if it were integrated into every subject area.” (K14)

Teachers also agree that children should be raised with sustainability awareness from an early age. It is emphasized that such awareness leads to behavioral change and contributes to the development of environmentally responsible individuals.

“These kinds of learning outcomes are very permanent, especially for children at primary school age.” (K17)

“When we help children develop a love for nature, habits of protecting nature also develop.” (K14)

Overall, teachers’ attitudes toward education for sustainable development are positive, and they strongly believe in its individual and societal benefits. Teachers express a desire for this education to become a permanent component of the education system and argue that structural transformations at the curriculum level are necessary to achieve this goal.

Instructional Methods and Techniques Used by Teachers in Education for Sustainable Development

Information regarding the instructional methods and techniques used by teachers in education for sustainable development is presented in Table 7.

Table 7

Methods and Techniques Used in Education for Sustainable Development

Theme	Sub-theme	Code	Participant Code	f
Methods and Techniques Used in Education for Sustainable Development	Technological methods and applications	Digital content and educational technologies	K6, K7, K8, K9, K10	5
	Activity- and project-based methods	Hands-on activities and projects	K11, K12, K13, K14, K15	5
	Participatory and interactive methods	Interdisciplinary studies and group work	K16, K17, K18	3

The findings reveal the methods and techniques used by teachers in education for sustainable development. It is observed that teachers experience transformation at emotional, physical, and cultural levels during this process and become increasingly aware of the long-term social, environmental, and economic benefits of sustainable development.

In particular, the integration of technological methods into the teaching process has made this education more engaging and effective. Teachers state that digital content increases students' interest and supports the permanence of learning.

"I prepare videos, games, and presentations related to the environment by using digital platforms. Children really enjoy this." (K8)

"Thanks to digital content, abstract concepts such as sustainability become more concrete." (K9)

Activity-based and project-based methods are among the most frequently preferred techniques by teachers, as they enable students to learn through practice. Project-based learning stands out as an effective method for developing environmental awareness among students.

"We carried out a recycling project with the children and made toys from plastic bottles. In this way, they both learned and had fun." (K13)

"Project-based activities ensure active student participation and increase sustainability awareness." (K15)

In addition, participatory and interactive methods, interdisciplinary

collaborations, and group work practices provide a student-centered learning environment. These approaches are reported to enhance students' cooperation, responsibility-taking, and problem-solving skills.

"Through group work, children learn to think from different perspectives." (K17)

"I teach sustainability by integrating science, social studies, and visual arts courses." (K16)

As teachers' levels of knowledge about sustainable development increase, their willingness to implement this knowledge in classroom practices also rises. This creates a foundation for the conscious use of instructional methods and techniques. Teachers' views indicate that this type of education has a transformative impact not only on students but also on the classroom environment and society as a whole.

"I am not only teaching lessons to students; I am preparing them for life. That is why sustainability issues are very important." (K10)

Teachers consciously apply methods and techniques related to education for sustainable development and aim to achieve lasting learning through technological tools, projects, activities, and interdisciplinary practices. This situation fosters awareness at both individual and societal levels within the educational environment.

Teachers' Levels of Knowledge Regarding Education for Sustainable Development and Their Capacity to Implement This Knowledge in Practice

Information regarding teachers' levels of knowledge about education for sustainable development and their capacity to put this knowledge into practice is presented in Table 8.

Table 8

Teachers' Levels of Knowledge and Implementation Capacity

Theme	Sub-theme	Code	Participant Code	f
Teachers' Knowledge Level and Implementation Capacity	Awareness of Education for Sustainable Development	Knowledge transfer to new generations in education	K1, K2, K3, K4, K5	5
	Implementation capacity in education	Applicability of in-class and out-of-class activities	K6, K7, K8, K9, K10	5

Theme	Sub-theme	Code	Participant Code	f
	Project- and activity-based learning	Teachers' capacity to educate students through projects	K11, K12, K13, K14, K15	5

The findings demonstrate teachers' levels of knowledge and implementation capacities regarding education for sustainable development. The results reveal that teachers value not only possessing knowledge on this subject but also applying this knowledge through both in-class and out-of-class activities. Teachers explicitly state that they bear a responsibility to take an active role in education for sustainable development.

In particular, teachers with a higher level of awareness are motivated to transfer their knowledge to future generations and emphasize that this transfer should not be limited solely to academic content.

"We are teachers; we do not only provide knowledge to children, we prepare them for life. Sustainability is an important part of this." (K2)

"These issues are now vital for our future. It is our duty to instill environmental awareness in children at an early age." (K5)

In addition, teachers' implementation capacity is supported not only by classroom-based activities but also by extracurricular practices. This approach is reported to enable students to integrate the principles of sustainable development into their daily lives.

"We created a recycling area in the schoolyard with the children, and it had a strong impact on them." (K7)

"We encourage them to make observations outside the classroom. They bring their observations back to class, which makes learning more permanent." (K9)

Project- and activity-based learning enables teachers to establish an interactive learning process with students. Through this method, students not only acquire knowledge but also internalize values such as social responsibility and environmental awareness.

"We created an exhibition using waste materials. Families also participated, and everyone was impressed." (K12)

"We collected plastic waste in the neighborhood with students, and this changed their perspective on the environment." (K14)

According to the participants, for education for sustainable development to be effective, not only teachers' efforts but also support from state policies, media, and digital platforms is necessary.

"This should not be limited to schools; public service announcements, social media—everything should support this education." (K10)

Teachers' levels of knowledge and implementation skills regarding education for sustainable development are a determining factor in the dissemination of this education. Including parents and society in this process is crucial for extending education beyond the school and leading a broader social transformation.

Discussion

This study sought to develop an in-depth understanding of teachers' lived experiences with education for sustainable development, the barriers they encounter in instructional settings, the strategies they employ to address these challenges, and their underlying beliefs and attitudes toward sustainability-oriented education. Findings related to the first research question indicate that teachers attempt to convey sustainable development concepts primarily through knowledge transmission, the use of digital instructional materials, and interdisciplinary project-based practices. With regard to the second research question, key barriers were identified as students' lack of motivation, insufficient social awareness, and limitations in educational infrastructure. To overcome these challenges, teachers emphasized the importance of hands-on learning activities and awareness-raising practices. Findings addressing the third research question revealed that teachers across different subject areas generally hold positive beliefs and attitudes toward education for sustainable development; however, these orientations are constrained by curriculum-related inadequacies. In relation to the fourth and fifth research questions, while digital content and experiential activities were found to positively influence teachers' attitudes toward sustainable development, teachers' capacity to translate theoretical knowledge into consistent classroom practice remained limited.

These findings are supported by empirical evidence from large-scale studies in the literature. For instance, a study conducted with 371 teachers reported that male teachers exhibited more positive beliefs regarding education for sustainable development than female teachers, and that secondary school teachers demonstrated stronger beliefs toward sustainable development practices compared to teachers at other educational levels (Sinakou, Donche, Boeve-de Pauw, & Van Petegem, 2021). This evidence underscores the role of teachers' personal belief systems, professional backgrounds, and institutional contexts in shaping their engagement with education for sustainable development. Taken together, both the present findings and prior research

highlight that while teachers generally demonstrate favorable attitudes toward sustainability, structural and curricular constraints may hinder the effective translation of these beliefs into pedagogical practice.

The findings indicate that teachers' efforts toward education for sustainable development are generally positive but constrained by various challenges. In particular, the use of digital content and projects has emerged as an effective method for engaging students in this education. This finding aligns with studies in the literature emphasizing the contribution of digital educational materials to sustainability education. Kiely, Parajuly, Green & Fitzpatrick (2021), stated that the use of digital platforms in education for sustainable development increases student engagement and is effective in fostering environmental awareness. Johnson et al. (2017) emphasized that digital tools and online learning environments enable teachers to convey sustainability topics more effectively and provide students with a broader perspective. Ismail & Aldous (2025), noted that digital materials play a significant role in helping students develop environmental sensitivity, particularly through interactive projects and simulations. Napal, Mendióroz-Lacambra & Peñalva (2020), found that digital content facilitates access to information and offers deeper learning opportunities in sustainability education while enabling educators to develop more effective instructional strategies. These studies demonstrate that digital content has become a crucial component of education for sustainable development and provides students with opportunities for deeper learning.

Nevertheless, the prominence of limited social awareness and infrastructural constraints as barriers distinguishes the present findings from much of the existing literature, where these factors are addressed less frequently. This divergence may be attributed to the cultural, institutional, and socioeconomic characteristics specific to Sivas province, suggesting that contextual factors play a significant role in shaping the implementation of education for sustainable development. Consistent with previous studies, teachers' awareness-raising practices were found to contribute positively to behavioral change among students, indicating the potential of pedagogical interventions aimed at fostering sustainability consciousness. Nevertheless, persistent curriculum-related deficiencies and infrastructural limitations continue to constrain teachers' instructional effectiveness, reinforcing findings reported in earlier research and underscoring the structural challenges that impede the realization of sustainability-oriented educational goals.

Despite its contributions, the study is subject to several limitations that should be acknowledged. The research was conducted with a relatively small sample of 18 teachers from different subject areas within Sivas province, which may limit the transferability and generalizability of the findings. Additionally, the short duration of the study precluded the examination of long-term impacts of education for sustainable

development practices. Although the data collection instruments demonstrated validity and reliability, the limited implementation period restricted a comprehensive evaluation of instructional activities. Furthermore, the region's socioeconomic conditions and cultural context may constrain the comparability of the findings with those from other settings. Accordingly, future research is recommended to employ larger and more diverse samples, extended timeframes, and comparative designs across different regions to deepen understanding and enhance the robustness of findings in education for sustainable development.

Conclusion

This study demonstrates that teachers employ a variety of instructional methods within education for sustainable development and highlights the ways in which these methods contribute to nurturing students as environmentally conscious and socially responsible individuals. Teachers reported that active learning strategies—such as the use of digital instructional content, collaborative group work, brainstorming activities, and drama-based practices—are particularly effective in fostering students' scientific thinking, decision-making abilities, and academic achievement. In line with these findings, Jones (2020) emphasized that active learning approaches play a significant role in enhancing students' knowledge and understanding of environmental issues and sustainable development by promoting engagement, critical reflection, and meaningful learning experiences.

In addition to instructional methods, teachers' perceptions of themselves as role models emerged as a key factor in strengthening students' awareness of sustainable development. Teachers highlighted that modeling sustainable attitudes and behaviors reinforces the impact of classroom-based instruction and supports the internalization of sustainability values among students. Similarly, Smith (2019) argued that encouraging environmentally responsible behaviors alongside the transmission of knowledge is essential for the effectiveness of education for sustainable development. Together, these findings suggest that pedagogical practices grounded in active learning and value-oriented modeling contribute substantially to students' development as individuals who are not only informed about sustainability but also motivated to act in environmentally responsible ways.

Rather than reiterating specific findings, this study makes visible the relational and process-oriented nature of education for sustainable development as enacted by teachers. The findings highlight that education for sustainable development is not merely a curricular component or a set of instructional activities, but a pedagogical process shaped by teachers' lived experiences, belief systems, and contextual constraints. By foregrounding teachers' experiential meanings, the study contributes to a deeper understanding of how sustainability education is interpreted and operationalized at the

classroom level. From a theoretical perspective, this study underscores the mediating role of teachers' beliefs between sustainability-oriented education policies and classroom practices. Empirically, it demonstrates that the successful implementation of education for sustainable development cannot be fully understood without examining teachers' subjective interpretations and professional experiences. In this respect, the study extends existing research by moving beyond attitude-based assessments and offering a phenomenological account of how sustainability education is lived, negotiated, and constrained in practice.

While teachers' experiences with education for sustainable development have the potential to create positive changes at the societal level, overcoming existing barriers is crucial for the effectiveness of this process. Moreover, the findings highlight teachers' critical role in developing an education system based on sustainable development goals and can guide policymakers and educational planners. This study offers concrete recommendations for increasing teachers' awareness of sustainable development goals, developing more effective instructional strategies, and transferring these goals to students.

Major barriers in education include lack of social awareness, local infrastructure deficiencies, and student reluctance. To overcome these barriers, teachers emphasized the need for comprehensive strategic planning and the inclusion of families and local governments in the educational process. Poppe, Weigelhofer & Winkler (2018), highlighted the critical importance of social participation and family support in education for sustainable development. Teachers strongly advocate the social benefits and importance of education for sustainable development, emphasizing its critical role in fostering environmental awareness and creating lasting social consciousness.

At the policy level, the findings suggest that sustainability-oriented educational reforms should move beyond formal curricular inclusion and address the contextual conditions that shape teachers' implementation capacities. At the level of teacher education, the study points to the need for professional development initiatives that support teachers in critically engaging with sustainability concepts and integrating them into everyday pedagogical practice. At the school level, creating supportive institutional environments that encourage interdisciplinary collaboration and experiential learning emerges as a key factor in strengthening education for sustainable development.

Recommendations

Integration into the Curriculum:

Integrating education for sustainable development into the curriculum will enable children to develop awareness of environmental and resource use issues from an early age. Duran & Mariñas (2024) argues that integrating sustainability topics into the

education system provides students with in-depth knowledge of environmental issues.

Family and Community Participation

Families should be involved in the educational process, and awareness-raising activities on sustainable development should be expanded at the community level. Parents and local governments should participate in this process, increasing public awareness through projects such as recycling initiatives. Tilbury & Wortman (2008) emphasize the significant role of out-of-school stakeholders in raising social awareness.

Projects and Hands-on Activities

Projects and hands-on activities for students will help teachers effectively convey their knowledge of sustainable development. These activities are expected to reinforce students' sustainability awareness in their daily lives. Anand & Krishnan (2026) found that active participation in learning processes strengthens students' sustainable development skills.

Social Awareness Initiatives

Media, digital platforms, and state policies should contribute to disseminating education for sustainable development throughout society. These platforms should be used effectively to reach wider audiences. Hamid, Ijab, Sulaiman, Anwar & Norman (2017) discuss how media and digital platforms can serve as effective tools for increasing environmental awareness.

Infrastructure and Resource Provision

Addressing local infrastructure deficiencies and strengthening sustainability-related infrastructure in schools will enhance the efficiency of the educational process. Kunuba (2024) argues that improving sustainable development infrastructure in schools positively affects educational outcomes.

Teachers' attitudes and practices regarding education for sustainable development can lead to significant changes at both individual and societal levels. However, for this process to function effectively, educational barriers must be overcome, social awareness must be increased, and curricula must be strengthened. In this way, education for sustainable development can contribute to building a more conscious and environmentally sensitive society.

References

- Arslan, A., & Durmuş, E. (2025). Green prospective teachers: A research on prospective teachers' sustainable environmental behaviors, consumption habits and ecological footprint awareness. *SAGE Open*, 15(3), 21582440251365820.
- Anand, A. J., & Krishnan, S. (2026). *Smart technologies for sustainable development goals: Quality education*.
- Borg, C., Gericke, N., Höglund, H. O., & Bergman, E. (2012). The barriers encountered by teachers implementing education for sustainable development: Discipline-bound differences and teaching traditions. *Research in Science Education*, 42(1), 1–24.
- Çetin, O., & Erdoğan Çetin, N. (2023). Teachers' perceptions of the concept of sustainable development. *International Journal of Social and Humanities Sciences Research*, 10(98), 2108–2116.
- Dewey, J. (1938). *Experience and education*. Macmillan.
- Duran, M. K. L., & Mariñas, K. A. (2024). Sustainability integration in Philippine higher education curricula: A structural equation modeling assessing teacher intention to integrate. *Sustainability*, 16(9), 3677.
- Eğmir, E., Göres, A., & Beycan, F. (2021). Examining the predictive power of teachers' educational beliefs on their perceptions of professional competence. *Turkish Journal of Educational Sciences (TEBD)*, 19(1), 663–684.
- Eğitim Reformu Girişimi. (2022). *Türkiye’de eğitimde eşitsizlikler ve politika uygulamaları*.
- Güven, K., & Genç, E. (2024). An examination of teachers' self-efficacy beliefs in implementing the constructivist approach. *Bolu Abant İzzet Baysal University Journal of the Faculty of Education*, 24(1), 363–388.
- Hamid, S., Ijab, M. T., Sulaiman, H., Md. Anwar, R., & Norman, A. A. (2017). Social media for environmental sustainability awareness in higher education. *International Journal of Sustainability in Higher Education*, 18(4), 474–491.
- Howarth, R. B. (2012). Sustainability, well-being, and economic growth. *Minding Nature*, 5(2), 32–39.
- Ismail, G. A., & Aldous, S. M. (2025). Digital innovation in green learning: Ensuring safety while fostering environmental stewardship. In *Legal frameworks and educational strategies for sustainable development* (pp. 307–336). IGI Global.
- Johnson, L., Adams Becker, S., & Cummins, M. (2017). *The NMC horizon report: 2017 higher education edition*. The New Media Consortium.

- Jones, R. G. (2020). *The applied psychology of sustainability*. Routledge.
- Kaynak, N. E., Altan, A. E., Abbak, Y., Alp, Z. A., Yavuz, E., & Toprak, E. (2023). A theoretical perspective on quality education in terms of sustainable development. *Iğdır University Journal of Social Sciences*, (34), 592–609.
- Kopnina, H. (2020). Education for the future? Critical evaluation of education for sustainable development goals. *The Journal of Environmental Education*, 51(4), 280–291.
- Korkmaz, G. (2020). Yenilenen öğretmen yetiştirme lisans programlarının sürdürülebilir kalkınma için eğitim bağlamında incelenmesi. *Journal of Advanced Education Studies*, 2(2), 111–132.
- Kiely, L., Parajuly, K., Green, J. A., & Fitzpatrick, C. (2021). Education for UN Sustainable Development Goal 12: A cross-curricular program for secondary level students. *Frontiers in Sustainability*, 2, 638294.
- Kunuba, A. C. (2024). Comparative analysis of smart green schools and conventional schools in Enugu State: Evaluating students' health awareness, environmental behavioural practices, infrastructural designs and maintenance effectiveness. *Godfrey Okoye University International Journal of Education*, 3(3).
- Napal, M., Mendióroz-Lacambra, A. M., & Peñalva, A. (2020). Sustainability teaching tools in the digital age. *Sustainability*, 12(8), 3366.
- Poppe, M., Weigelhofer, G., & Winkler, G. (2018). Public participation and environmental education. In *Riverine ecosystem management: Science for governing towards a sustainable future* (pp. 435–458). Springer International Publishing.
- Sachs, J. D. (2015). *The age of sustainable development*. Columbia University Press.
- Sinakou, E., Donche, V., Boeve-de Pauw, J., & Van Petegem, P. (2021). Development and validation of a questionnaire on teachers' instructional beliefs and practices in education for sustainable development. *Environmental Education Research*, 27(9), 1305–1328.
- Smith, W. (2019). The role of environment clubs in promoting ecocentrism in secondary schools: Student identity and relationship to the earth. *The Journal of Environmental Education*, 50(1), 52–71.
- Şeker, F., & Aydın, B. (2021). Education and competencies for sustainable development from the perspective of science teachers. *e-Kafkas Journal of Educational Research*, 8, 460–479.

- Tilbury, D., & Wortman, D. (2008). How is community education contributing to sustainability in practice? *Applied Environmental Education and Communication*, 7(3), 83–93.
- UNESCO. (2015). *Education 2030: Incheon declaration and framework for action*. UNESCO.
- UNESCO. (2017). *Education for sustainable development goals: Learning objectives*. UNESCO.
- World Commission on Environment and Development. (1987). *Our common future*. Oxford University Press.
- Wilson, A. (2015). A guide to phenomenological research. *Nursing Standard*, 29(34), 38–43. <https://doi.org/10.7748/ns.29.34.38.e8821>

Web Sources

- Ekolojist. (2025, July 10). Core dimensions and subdomains of sustainable development. <https://ekolojist.net/surdurulebilirlik-nedir/>
- Ministry of National Education. (n.d.). Decisive steps toward quality education project. <https://batman.meb.gov.tr/www/nitelikli-egitime-kararli-adimlar-projesi/icerik/2886>
- UNESCO National Commission of Türkiye. (n.d.). 2030 Sustainable development goals specialized committee. <https://www.unesco.org.tr/Pages/108/219>
- ConceptDraw. (2025, December 21). Sustainable development Venn diagram [Diagram]. ResearchGate. https://www.researchgate.net/figure/Sustainable-Development-Venn-diagram-Conceptdraw-2019_fig1_338557005

“COPE-Dergi Editörleri İçin Davranış Kuralları ve En İyi Uygulama İlkeleri” beyanları:

- Etik Kurul Belgesi:** Bu çalışma için etik kurul onayı gerekmemektedir.
- Çıkar Çatışması Beyanı:** Bu makalenin araştırması, yazarlığı veya yayınlanmasıyla ilgili olarak yazar/ların potansiyel bir çıkar çatışması yoktur.
- Finansal Destek:** Bu çalışmanın araştırma ve yazım aşamasında herhangi kişi/kurum veya kuruluşlar tarafından finansal destek alınmadığı bildirilmiştir.
- Katkı Oranı Beyanı:** %34-%33-%33
- Destek ve Teşekkür Beyanı:**
- Sorumlu Yazar:** Yeliz ÖZOĞUL
- Çifte Kör Hakem Değerlendirmesi:** Dış-bağımsız

The following statements are made in the framework of “COPE-Code of Conduct and Best Practices Guidelines for Journal Editors”:

Ethics Committee Approval:	Ethics committee approval is not required for this article.
Declaration of Conflicting Interests:	No conflicts of interest were reported for this article.
Financial Support:	It has been reported that this study did not receive financial support from any person/institution or organization during the research and writing phase.
Author Contributions:	%34-%33-%33
Statement of Support and Acknowledgment:	
Corresponding Author:	Yeliz ÖZOĞUL
Double-Blind Peer Review:	External-independent