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Teacher Perspectives on Sustainability Education in Primary Schools in the Republic of Cyprus: An Exploratory Survey

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Abstract

Sustainability has gained considerable importance over recent decades, becoming a central concept across numerous areas of society. Introducing sustainability principles during the early stages of education is particularly important because the elementary school years constitute a critical period in children's development. During these formative years, children establish fundamental values, attitudes and behaviours that can significantly influence their future lives and their relationship with the natural environment. Elementary schools provide a distinctive opportunity to engage children from diverse social backgrounds and establish a shared foundation of knowledge that can contribute to the development of a more sustainable society. They therefore represent an appropriate educational setting in which children can become familiar with sustainability principles and develop awareness of the major challenges facing society in the twenty-first century. This study aims to examine the current position of sustainability education within elementary schools. More specifically, it investigates whether elementary school pupils are sufficiently mature to engage with sustainability-related issues, identifies the teaching methods already being applied and explores the challenges associated with implementing sustainability education. The study is based on an online survey conducted across 60 elementary schools in South Cyprus. Although further improvements remain necessary, the survey findings indicate an increasing recognition of the importance of sustainability education within elementary schools. The results highlight the need for focused measures to strengthen curriculum integration, improve teacher training and increase the availability of appropriate educational resources, thereby supporting the development of a more sustainable and environmentally aware generation of pupils in different schools in South Cyprus.

1. Introduction

Sustainability has become an increasingly important educational priority in response to environmental, social and economic challenges. Introducing sustainability during primary education is particularly significant because childhood represents a formative period in which values, attitudes and patterns of behaviour begin to develop. Early experiences of nature and environmental learning can influence how individuals understand and respond to sustainability concerns later in life (Chawla, 2020). Primary schools therefore provide an important setting for introducing pupils from diverse backgrounds to sustainability principles and supporting the development of shared environmental knowledge and responsibility.

Effective sustainability education requires more than the communication of environmental information. It should help pupils understand the relationship between their everyday actions, the natural environment and wider societal challenges while encouraging active participation and age-appropriate problem-solving (Ampartzaki et al., 2021; Nousheen et al., 2020). Teachers have a central role in this process because their knowledge, confidence, teaching approaches and access to appropriate resources can influence how sustainability is addressed in the classroom (Timm and Barth, 2020). Nevertheless,

integrating sustainability into primary education may be affected by limited curriculum coverage, insufficient teacher training, inadequate educational materials and financial constraints.

Within the Republic of Cyprus, further empirical evidence is required to understand how primary school teachers perceive the current provision of sustainability education. Examining teachers' perspectives can provide valuable initial evidence concerning pupils' perceived awareness, the age appropriateness of sustainability education, its reported integration into classroom practice, the availability of professional training and the barriers affecting implementation. Accordingly, this exploratory study investigates primary school teachers' perspectives on sustainability education in the Republic of Cyprus through an online questionnaire. The study aims to identify existing strengths and limitations and to inform future curriculum development, teacher education and resource provision. As the findings are based on teachers' self-reported perceptions, they are intended to provide exploratory evidence rather than a direct assessment of pupils' knowledge or a comprehensive evaluation of the national curriculum.

2. Literature Review

2.1 Scope and Approach of the Literature Review

A focused narrative literature review was undertaken to establish the conceptual and empirical background of the study. Narrative reviews support the synthesis of knowledge from different forms of research and help identify established perspectives, areas of agreement and continuing gaps within a field (Snyder, 2019). The review was used to contextualise the Cyprus survey rather than to produce an exhaustive or systematic assessment of all available literature.

Sources were selected according to their relevance to five principal areas: sustainability education during childhood, the role of teachers, curriculum integration, teaching approaches and barriers to implementation. Priority was given to peer-reviewed publications issued between 2018 and 2024, while earlier sources were retained where they provided important methodological or conceptual foundations. The review also considered the methodological quality, relevance and educational context of the publications. This approach enabled the existing literature to inform the development of the research questions and the interpretation of teachers' perspectives while recognising that the review was selective rather than systematic (Barry, Merkebu and Varpio, 2022).

2.2 Sustainability Education and Pedagogy

Sustainability education during childhood can influence how individuals understand their relationship with the natural environment and the consequences of their everyday actions. Limited environmental education and reduced contact with nature may prevent children from recognising the broader effects of their behaviour (Alam, 2022). Research indicates that individuals who develop a connection with nature through direct experiences during childhood are more likely to value and protect the natural environment later in life (Chawla, 2020). Primary education therefore represents an important stage for developing environmental awareness, responsibility and constructive attitudes towards sustainability.

Sustainability education should enable pupils to understand, protect and positively influence their surroundings while maintaining a sense of hope. Environmental and climate-related issues should be communicated carefully because presenting them primarily through fear may create anxiety or disengagement among younger pupils (Määttä et al., 2020). Effective sustainability education should instead help children understand the relationships between individuals, communities, human wellbeing and the wider biosphere. Education can consequently contribute to the broader social transformation required to support sustainable development (Shutaleva et al., 2020). Children should also be encouraged to recognise how their actions affect the environment and to participate actively in age-appropriate forms of sustainable change (Trott, 2019).

Primary schools provide a shared educational environment in which pupils from different social and cultural backgrounds can develop common knowledge and values. Sustainability topics such as waste reduction, energy conservation, responsible consumption, biodiversity and ecosystem protection can be incorporated into existing subjects or addressed through dedicated projects (Liu, Yang and Shiau, 2020; Yli-Panula et al., 2020). Natural sciences, social sciences and languages offer particularly suitable opportunities for curriculum integration (Sukma et al., 2020). However, when sustainability is not clearly included within curriculum expectations, teachers may have limited time to implement substantial projects alongside existing teaching requirements (White et al., 2018). This demonstrates that successful implementation depends not only on individual teacher commitment but also on appropriate curriculum design and institutional support.

Teachers play a central role in translating sustainability objectives into meaningful classroom experiences. Their understanding of sustainability, confidence, motivation and ability to engage pupils can influence the effectiveness of educational initiatives (Ampartzaki et al., 2021; Timm and Barth, 2020). Curriculum reform alone is therefore unlikely to produce meaningful change unless teachers possess the knowledge and competencies required to communicate sustainability in ways that are appropriate to pupils' ages and levels of understanding. Previous research has identified insufficient initial teacher preparation and limited continuing professional-development opportunities as significant barriers to implementation (Nousheen et al., 2020; Timm and Barth, 2020). Appropriate training is especially important because teachers can act as role models whose attitudes and behaviours may influence those of their pupils (Sukma et al., 2020).

Sustainability education should extend beyond the transmission of environmental facts. Climate change and related challenges can generate fear, uncertainty and other negative emotions among children. Teachers must therefore acknowledge these emotional responses while helping pupils imagine constructive alternatives and recognise their capacity to contribute to change (Trott, 2019). A holistic approach should support the development of knowledge, values, behaviour and social, emotional and practical competencies (Chan et al., 2020). This approach can enable pupils to examine sustainability from multiple perspectives and develop the critical and collaborative abilities required to address complex environmental challenges.

The selection of suitable teaching methods is equally important. Interactive outdoor learning can allow pupils to investigate familiar environments, understand the consequences of their actions and develop solution-oriented thinking (Ampartzaki et al., 2021; White et al., 2018). School gardening and similar activities can support environmental understanding while also contributing to pupils' physical and psychological wellbeing. Such opportunities may be particularly beneficial for children who have limited access to natural spaces outside school.

Storytelling and digital learning also provide opportunities to make theoretical sustainability content more engaging and accessible. Storytelling can combine factual information with emotional and cultural elements, while digital storytelling can present information visually and interactively (Tzima et al., 2020). Augmented-reality applications may similarly combine theoretical knowledge with active exploration and increase pupils' motivation and participation. Evidence from primary education suggests that the usability of these technologies can influence both learning outcomes and pupils' acceptance of the method (Lo, Lai and Hsu, 2021). Nevertheless, digital approaches should support rather than replace direct engagement with the environment.

Ampartzaki et al. (2021) identify several principles that can support effective sustainability education:

- presenting sustainability content coherently and connecting it with pupils' existing knowledge
- allowing sufficient space for creativity and independent exploration
- relating sustainability to matters that pupils consider personally meaningful
- providing opportunities to reflect on and process newly acquired knowledge

Innovative and participatory methods can support deeper understanding and improve pupils' engagement with sustainability (Nousheen et al., 2020). By contrast, approaches based exclusively on predetermined outcomes or the one-way transmission of information may be less suitable for developing the knowledge, values and competencies associated with sustainability. The literature therefore demonstrates that effective sustainability education depends on the interaction of curriculum provision, teacher preparation, suitable resources, institutional support and age-appropriate pedagogical methods. These themes provide the conceptual basis for examining primary school teachers' perspectives within the Republic of Cyprus.

2.3 Research Gap and Research Questions

The literature demonstrates the increasing importance of sustainability education during the early years of schooling for developing environmental responsibility and equipping children with the knowledge and competencies required to respond to environmental challenges (Ampartzaki et al., 2021; Nousheen et al., 2020; Timm and Barth, 2020). Nevertheless, its implementation at the primary-school level remains inconsistent. Sustainability may not be integrated coherently across the curriculum, while limited teacher preparation, insufficient educational resources and competing curriculum demands can restrict its effective delivery. These conditions may reduce opportunities for pupils to develop sustainability-related knowledge, attitudes and behaviours consistently throughout their primary education.

Although international research has examined sustainability education and the role of teachers, the literature reviewed for this study indicates that empirical evidence concerning primary school teachers' perspectives in the Republic of Cyprus remains limited. In particular, further evidence is required regarding how teachers perceive pupils' existing awareness, whether they consider sustainability education appropriate for primary-school ages, how they view its integration into the curriculum, what professional-development opportunities are available to them and what barriers they encounter during implementation. Examining these perspectives can provide exploratory evidence concerning current practice and identify priorities for curriculum development, teacher education and educational-resource provision. Accordingly, the study addresses the following research questions:

RQ1

How do primary school teachers assess pupils' awareness of sustainability?

RQ2

What are teachers' views concerning the age appropriateness of sustainability education?

RQ3

How do teachers perceive the integration of sustainability into primary school curricula?

RQ4

What access do primary school teachers report having to sustainability-related training?

RQ5

What barriers do teachers identify in integrating sustainability into primary education?

3. Methods

3.1 Research Design and Setting

This study adopted an exploratory, cross-sectional survey design to examine primary school teachers' perspectives on sustainability education in the Republic of Cyprus. An online questionnaire was selected because it enabled the collection of self-reported information from teachers working across different schools and geographic areas within a relatively short period (Singh and Sagar, 2021). The questionnaire was distributed through 60 primary schools located across the main urban areas of the Republic of Cyprus. The selection sought to achieve geographic coverage, with at least ten schools approached in each of the principal areas included in the study. The schools were located in Nicosia, Limassol, Larnaca and Paphos and included both public and private primary schools.

3.2 Recruitment and Participants

Primary schools were initially contacted by telephone to request their participation. However, because telephone recruitment proved highly time-consuming, the remaining schools were subsequently approached by email. Invitations containing information about the study and a direct link to the online questionnaire were sent to head teachers, school secretaries and, where contact information was available, individual teachers. Recipients were also invited to distribute the questionnaire to other eligible primary school teachers. This chain-referral process introduced an element of snowball sampling, through which existing contacts assisted in extending the survey's reach (Handcock and Gile, 2011). Although this approach supported participant recruitment, it also created a risk of self-selection and representation bias. These limitations were considered when interpreting the findings. Through this recruitment process, the survey reached 77 primary school teachers, of whom 51 completed the questionnaire. Data collection took place during September and October 2025.

3.3 Survey Instrument

The questionnaire was administered using the online survey platform Survio (https://www.survio.com). It was developed specifically for the present study and was not adapted from an existing survey instrument. The questions were informed by the literature review and aligned with the study's aim and five research questions. The questionnaire consisted of nine questions examining teachers' perceptions of pupils' sustainability awareness, the age appropriateness of sustainability education, curriculum integration, teaching materials, school projects, encouragement of sustainable behaviour, professional training and barriers to implementation. Most questions were closed-ended, while three allowed participants to provide text-based responses. The online format enabled respondents to complete the questionnaire at a convenient time and consider the questions at their own pace. Online surveys can facilitate access to geographically dispersed participants while reducing the time required for questionnaire distribution and data collection (Aityan, 2022; Wu, Zhao and Fils-Aime, 2022). Completion required approximately two to five minutes.

3.4 Data Analysis

Responses to the closed-ended questions were analysed using descriptive statistics, including frequencies and percentages. Survio was used to collect the responses and generate the initial descriptive summaries. The findings were subsequently organised and reviewed in relation to the five research questions. Percentages were calculated using the valid responses recorded for each individual question. Therefore, where respondents did not answer a particular item, the percentage distribution was based on the number of valid responses to that question rather than the total number of completed questionnaires. The valid response total for each question was retained as the relevant denominator and is reported alongside the corresponding findings. The three text-based questions were reviewed to clarify and contextualise the responses obtained through the closed-ended items. No formal thematic or qualitative coding procedure was undertaken because these responses were intended to provide supplementary information rather than constitute an independent qualitative dataset. The analysis was therefore primarily descriptive and exploratory, reflecting the study's purpose of identifying general patterns in primary school teachers' perspectives on sustainability education.

3.5 Ethical Considerations

The study protocol was reviewed and approved by the Cyprus National Bioethics Committee under approval number ΕΕΒΚ ΕΠ 2024.01.18. The research was conducted in accordance with the General Data Protection Regulation (GDPR; Regulation (EU) 2016/679), the Bioethics Law of 2010 [N. 53(I)/2010] and the applicable Codes of Practice for the Bioethical Evaluation of Scientific Research in Cyprus (Κ.Δ.Π. 228/2022). Before participating, respondents received information explaining the purpose of the study, the questionnaire procedure, the voluntary nature of participation and the intended use of the collected data. Informed consent was obtained before respondents proceeded with the questionnaire. Participants were able to discontinue their participation before submitting their responses. No names or direct personal identifiers were requested, and all responses were treated anonymously and confidentially throughout data collection, analysis and reporting.

4. Results

To introduce the survey topic, participants were first asked whether sustainability was already being addressed within their primary schools. This question aimed to establish an initial overview of the extent to which sustainability was present in current school practice. The findings indicate that 57.7% of respondents reported that sustainability was addressed only very rarely in primary education. This substantial proportion suggests that further action may be required to strengthen the integration of sustainability topics within the curriculum. By comparison, 23.1% of teachers reported that sustainability was discussed extensively within their primary schools. This finding is encouraging because it indicates that some schools have already introduced measures to incorporate sustainability into their educational practices. These schools could provide useful examples for others and demonstrate that environmental education can be promoted successfully at the primary school level. Only 5.8% of respondents stated that sustainability was not addressed at their school **(Fig. 1)**.

Figure 1. Extent to which sustainability is addressed in the classroom.

Figure 2. Preferences for placing greater emphasis on sustainability.

The second survey question aimed to establish how primary school teachers evaluate pupils' knowledge of sustainability. Most of the teachers surveyed, representing 77.4% of respondents, considered primary school pupils' knowledge of sustainability to be low. However, a more positive finding was that 17% of teachers assessed pupils' sustainability knowledge as high. The present results cannot determine whether this knowledge was developed through effective sustainability education or acquired through other sources of influence. A further concerning finding was that 5.7% of the teachers believed that primary school pupils possessed no knowledge of sustainability.

This finding leads to the important question of whether primary school pupils are developmentally prepared to engage appropriately with sustainability at their age. To investigate this issue, the third survey question asked teachers whether they would prefer greater emphasis to be placed on

sustainability during classroom teaching. A notable 96.2% of the participating teachers stated that sensitising children to sustainability from an early age was highly important. This result demonstrates considerable agreement and support among teachers for integrating sustainability topics into the curriculum. By comparison, only 3.8% of respondents believed that children were still too young to engage with sustainability-related issues **(Fig. 2)**.

The fourth question examined the school subjects through which sustainability was addressed. Geography was the most frequently identified subject, reported by 42.1% of respondents. This finding suggests that sustainability themes are commonly incorporated into geography lessons. This connection is understandable because geography is closely related to environmental and ecological contexts. A further 27.6% of teachers reported that no particular subject at their primary school was explicitly dedicated to sustainability. This result may indicate an absence of suitable curriculum provision or adequate resources for incorporating sustainability into teaching. Alternatively, sustainability may be addressed across several subjects without being identified explicitly as a separate topic.

“Other” was selected by 13.2% of respondents as a subject area through which sustainability was taught. This response remains open to interpretation and may represent school-specific initiatives or courses that do not correspond with the standard subject categories. Biology was similarly identified by 13.2% of respondents as a subject addressing sustainability. This association is understandable because biology is closely connected with ecological and environmental concerns. The remaining 3.9% of teachers reported that they did not know which subject included sustainability. This finding may reflect limited awareness of curriculum content or school activities relating to sustainability and may therefore indicate an information gap.

The results of the fifth question show that 40% of respondents relied exclusively on regular teaching materials to communicate sustainability concepts. A further 43.6% of teachers reported using specialised sustainability materials occasionally. Only 10.9% indicated that they consistently used specific textbooks and teaching resources when teaching sustainability concepts. These results demonstrate that although specialised sustainability resources are available, they are used consistently by only a minority of teachers. The remaining 5.5% selected “Other” when describing the teaching materials they used. This response may represent a range of alternative approaches, potentially including creative teaching practices or resources developed through teachers’ own initiative. The relatively limited use of specialised teaching resources indicates a need for more targeted sustainability materials.

Regarding projects and activities within school programmes that address environmental or sustainability issues, 48.1% of teachers stated that their schools occasionally organised environmental initiatives, as reported in the sixth question. This finding indicates that almost half of the participating teachers worked in schools that engaged in environmental or sustainability projects and activities at least periodically. It suggests that some awareness of environmental concerns exists and that schools are making efforts to introduce relevant initiatives.

In contrast, 26.9% of respondents worked in schools that did not organise any environmental or sustainability projects or activities. However, 21.2% of teachers reported that their schools conducted such projects and activities regularly, indicating a consistent commitment to incorporating sustainability into school life. This may reflect deeper engagement with environmental and sustainability concerns and suggest that these schools have adopted a more sustainability-oriented approach to their educational practices **(Fig. 3)**.

Figure 3. School-based projects and activities specifically addressing sustainability.

The seventh survey question examined whether teachers encouraged children to behave sustainably during their daily school activities. The findings show that most participating primary school teachers, representing 70.6% of respondents, reported raising pupils' awareness of sustainability without providing rewards for sustainable behaviour. This finding suggests that most teachers recognise some responsibility for developing pupils' awareness of sustainability. At the same time, their limited use of rewards may indicate that they do not consider sustainability to be a behaviour that should primarily be encouraged through external incentives. Instead, they may understand it as an intrinsic value that children should adopt on ethical grounds.

A further 23.5% of teachers reported that sustainability was not given any particular emphasis. The remaining 5.9% stated that they actively promoted sustainable behaviour and used rewards, representing a smaller but still significant group. These teachers appear to place greater emphasis on positive incentives as a means of encouraging pupils to adopt sustainable practices. Such an approach may be effective in strengthening pupils' participation, particularly among younger children who may not yet fully understand the broader importance of sustainability.

The eighth question investigated whether teachers received sufficient professional training to broaden their knowledge of sustainability. The findings indicate that 60.8% of respondents, representing the majority of the teachers surveyed, had occasional access to sustainability-related training. This is an encouraging finding because it shows that a considerable proportion of teachers have opportunities to expand their sustainability knowledge, even if these opportunities are not provided regularly.

However, a notable 35.3% of respondents, more than one-third of the participating teachers, reported that they were not offered any training on sustainability. This finding indicates a potential gap in professional development, particularly given the increasing importance of sustainability within contemporary society. The survey further reveals that only 3.9% of teachers regularly received opportunities to participate in sustainability training. Although this represents a positive development, the proportion of teachers benefiting from regular training remains limited. The findings therefore demonstrate a clear need to expand the availability of sustainability-focused training and professional-development opportunities for primary school teachers **(Fig. 4).**

Figure 4. Availability of sustainability-related training and further education for teachers.

The ninth and final survey question examined the challenges and barriers associated with incorporating sustainability into the curriculum. The findings show that the most frequently identified obstacle, reported by 42.4% of respondents, was insufficient funding and limited resources for sustainability programmes. This represents a substantial barrier because schools are often required to operate within restricted financial budgets. Integrating sustainability may involve additional expenditure on educational materials, teacher training and extracurricular initiatives. This finding emphasises the importance of encouraging educational authorities and policymakers to provide greater financial and material support for school-based sustainability initiatives.

The second most commonly reported barrier, identified by 31.8% of teachers, was the lack of suitable teaching resources and materials. Teachers require high-quality educational materials to incorporate sustainability into classroom teaching effectively. Educational publishers and relevant organisations should therefore provide teachers with appropriate resources that support the delivery of sustainability education.

A further 13.6% of the participating teachers selected “Other” challenges, demonstrating the range of additional barriers that may affect implementation. These alternative challenges require further investigation to identify the specific difficulties teachers experience and determine how they might be addressed.

Finally, 12.1% of respondents identified resistance from teachers and parents as an obstacle to sustainability initiatives. This finding highlights the importance of securing acceptance and support throughout the wider school community. Additional information and awareness-building activities may be required for both teachers and parents to communicate the benefits of sustainability education and reduce potential resistance **(Fig. 5).**

Figure 5. Challenges in integrating sustainability into the curriculum.

5. Conclusion

1.1 Discussion

Drawing on the findings of the study, the five previously established research questions (RQ1, RQ2, RQ3, RQ4 and RQ5) can now be addressed, providing a comprehensive understanding of the current condition of sustainability education in elementary schools across South of Cyprus. The findings indicate that elementary school students have limited awareness of sustainability (RQ1). A total of 77.4% of respondents assessed children’s sustainability knowledge as low. This finding suggests that existing educational efforts may be insufficient to equip children with a fundamental understanding of sustainability. It is an important result that may indicate a potential educational deficiency in this area. Sustainability education may not receive adequate emphasis in elementary schools, or teachers may face difficulties in communicating the subject effectively. The result may also suggest that children receive little information about sustainability at home, further reinforcing the essential role of schools.

The relatively small percentage of teachers (17%) who assessed students' awareness as high raises further questions concerning external influences, including parental guidance, or the presence of isolated but successful educational practices. The finding that 5.7% of the surveyed teachers believed that elementary school students have no sustainability knowledge at all is particularly concerning. It suggests that sustainability education may be neglected in certain schools or that children are not being adequately prepared to engage with this important subject. Collectively, these findings demonstrate that sustainability education can have a vital role in elementary schooling while also revealing considerable opportunities for improvement. Furthermore, 96.2% of the surveyed teachers confirmed that sustainability topics are suitable for elementary school children (RQ2). This strong level of agreement indicates that teachers appreciate the importance of introducing sustainability concepts during the early stages of children's education. In contrast, only 3.8% of respondents considered children too young to engage with sustainability matters. This small percentage demonstrates that only a limited minority of teachers believe sustainability topics should not yet be introduced at the elementary school level.

The findings also reveal that 57.7% of respondents stated that sustainability is addressed very rarely in elementary schools. This substantial percentage demonstrates the possible need for further action to incorporate sustainability topics more effectively into the curriculum (RQ3). Nevertheless, the finding that sustainability is given considerable attention in some schools (23.1%) demonstrates that effective implementation is achievable. These schools could therefore provide useful examples for developing a broader and more systematic approach to sustainability education. Although geography and biology were identified as subjects in which sustainability is addressed, 27.6% of the surveyed teachers reported that no specific subjects at their schools are explicitly devoted to sustainability. This represents another indication of a systematic gap in sustainability education. At the same time, a considerable proportion of schools engage with environmental and sustainability matters through projects conducted outside the standard curriculum, either occasionally (48.1%) or regularly (21.2%). The findings further demonstrate that teachers frequently lack adequate preparation in sustainability-related subjects (RQ4). While 60.8% of respondents reported receiving sustainability training only occasionally, 35.3% stated that they had no access to such training. This identifies a substantial gap in teachers' professional development, which may consequently reduce the quality of sustainability education provided to children. Only 3.9% of respondents reported receiving regular training, suggesting that sustainability has not yet become a professional-development priority. To strengthen the quality and consistency of sustainability education, teacher-training opportunities should therefore be expanded and offered more regularly. The principal challenges affecting the incorporation of sustainability into elementary school curricula were identified as restricted budgets (42.4%) and insufficient relevant teaching materials (31.8%) (RQ5). These findings underline the requirement for greater financial and material support to enable the effective delivery of sustainability education. In addition, 12.1% of respondents identified resistance from teachers and parents as a further obstacle, indicating the presence of socio-cultural challenges in introducing sustainability topics. Resistance among teachers may be associated with concerns about additional workloads or limited familiarity with sustainability, while parental resistance may arise from differing opinions about whether such subjects are appropriate for young children. Greater awareness and clearer

communication regarding the benefits of sustainability education could help address these concerns and strengthen support among both teachers and parents.

Nevertheless, as other studies indicate (Ampartzaki et al., 2021; Ladson-Billings, 2021; Nousheen et al., 2020; Timm and Barth, 2020), several measures may support the incorporation of sustainability content into education while developing the relevant competencies of both teachers and students. Timm and Barth (2020) recommend introducing sustainability education progressively as an integral component of teacher education. Developing teachers' competencies is essential for successfully communicating knowledge to children, together with selecting appropriate learning objectives, teaching tools and instructional methods. Identifying age-appropriate content and suitable learning methods is equally important (Ampartzaki et al., 2021; Timm and Barth, 2020).

Accordingly, the findings of the present study correspond with those reported in earlier research (Ampartzaki et al., 2021; Ladson-Billings, 2021; Nousheen et al., 2020; Timm and Barth, 2020). To some extent, the results reflect the transformation currently taking place within education systems as they seek to align themselves with sustainability-education objectives, including those established by the United Nations. The findings identify possible directions for strengthening sustainability education in elementary schools across Southern Cyprus and demonstrate that its implementation is a gradual process and a continuing learning experience for teachers and students alike. Future research and educational initiatives should concentrate on providing educational personnel with the necessary competencies while allowing sufficient time for these competencies to be developed.

1.2 Limitations and Future Research

Due to the relatively small sample of 51 responses and the application of snowball sampling, the empirical findings cannot be considered representative of the entire Southern Cyprus. Future studies should therefore seek to establish a broader and more comprehensive data foundation. The present study examined the extent to which sustainability is already addressed in elementary schools across South of Cyprus. Further research should investigate even deeper and expanded schools in Cyprus, as well as regions across Europe and internationally, to determine whether geographical differences exist. It would also be valuable to examine the different curricula to identify the extent to which sustainability education is currently incorporated and whether it could be given greater priority. Limited budgets and insufficient resources were identified as the most significant barriers. Consequently, investigating specific strategies for overcoming these challenges constitutes another important direction for future research.

1.3 Practical Implications

Overall, the study findings offer valuable information concerning the present condition of sustainability education in elementary schools across the Southern part of Cyprus. The survey demonstrated that sustainability is not incorporated consistently into the curriculum, as a considerable proportion of respondents reported that the topic receives limited attention. Nevertheless, it is positive that certain schools are actively supporting sustainability through a range of projects and initiatives. Elementary

school teachers also acknowledge the importance of sustainability education and demonstrate a strong willingness to raise children's awareness of the subject from an early age. This shared perspective among teachers presents an opportunity for educational authorities to prioritise and support the inclusion of sustainability topics within the curriculum. Although many teachers are willing to promote sustainability awareness, greater access to relevant training and professional-development opportunities remains necessary. A substantial proportion of respondents indicated that they had limited or no access to sustainability-focused training, emphasising the need for more comprehensive teacher education in this field. The principal obstacles to sustainability education include financial limitations, insufficient suitable teaching materials and possible resistance from teachers and parents. These barriers highlight the importance of allocating appropriate funding, supplying the required educational resources and encouraging acceptance throughout the school community to support the effective integration of sustainability into elementary school education.

In conclusion, although further improvements are required, the survey findings indicate an increasing recognition of the importance of sustainability education in elementary schools. The results demonstrate the need for targeted action to strengthen curriculum integration, teacher training and resource provision in elementary schools, thereby supporting the development of a more sustainable and environmentally aware generation of students in Southern Cyprus. These survey findings also have important implications for educational policy and professional practice. They demonstrate a clear agreement among elementary school teachers that sustainability education should be assigned a prominent position within the curriculum. This consensus could encourage school authorities and educational institutions to promote and support the systematic incorporation of sustainability topics into the curriculum.

Declarations

Author Contributions

Author Contributions: Conceptualization, SSD and GN; methodology, SSD and GN; validation, SSD and GN; formal analysis, SSD and GN; investigation, SSD; resources, SSD and GN; data curation, SSD and GN; writing, original draft preparation, SSD; writing, review and editing, SSD and GN; visualization, SSD and GN; project administration, SSD. Both authors have read and agreed to the published version of the manuscript.

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Ethical Approval: The study protocol was reviewed and approved by the Cyprus National Bioethics Committee under approval number ΕΕΒΚ ΕΠ 2024.01.18. The study was conducted in accordance with the General Data Protection Regulation (GDPR; Regulation (EU) 2016/679), the Bioethics Law of 2010 [N. 53(I)/2010] and the applicable Codes of Practice for the Bioethical Evaluation of Scientific Research in Cyprus (Κ.Δ.Π. 228/2022).

Informed Consent: All participants received information concerning the purpose and procedures of the study before participation. Participation was voluntary, and informed consent was obtained before respondents proceeded with the questionnaire. No names or direct personal identifiers were collected.

Data Availability: The data supporting the findings of this study are not publicly available because of participant confidentiality and data-protection requirements. Anonymised aggregate data may be made available by the corresponding author upon reasonable request, subject to the conditions of the ethical approval and applicable GDPR requirements.

Conflicts of Interest: The authors declare no competing financial or non-financial interests that could have influenced the design, conduct, analysis, interpretation or reporting of this study.

Clinical Trial Registration: Not applicable. The investigation concerns educational practices, reflective learning experiences and self-reported digital pedagogical measures and does not involve clinical trials, medical interventions or clinical research procedures.

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Figures

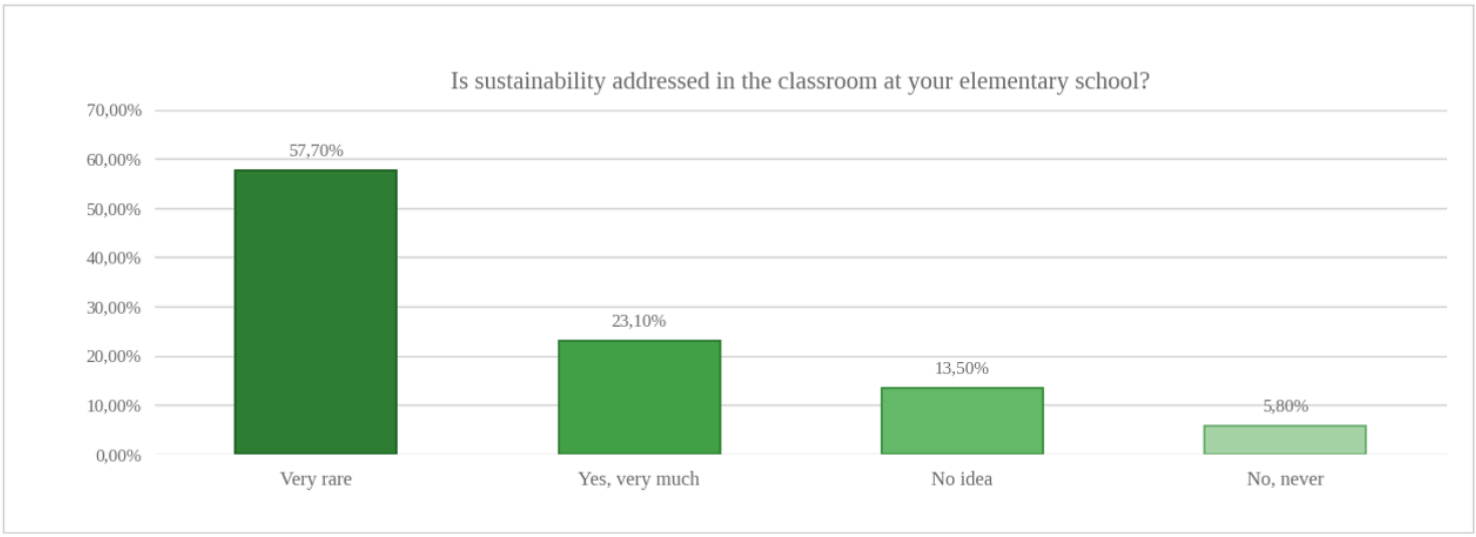

Figure 1

Extent to which sustainability is addressed in the classroom.

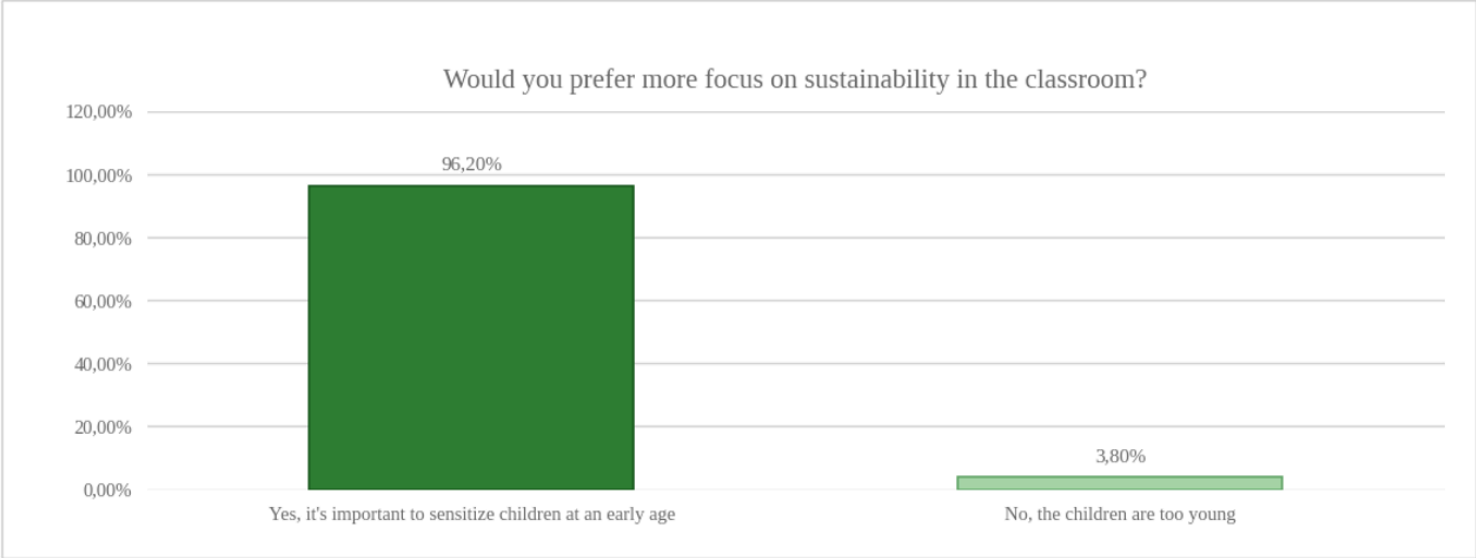

Figure 2

Preferences for placing greater emphasis on sustainability.

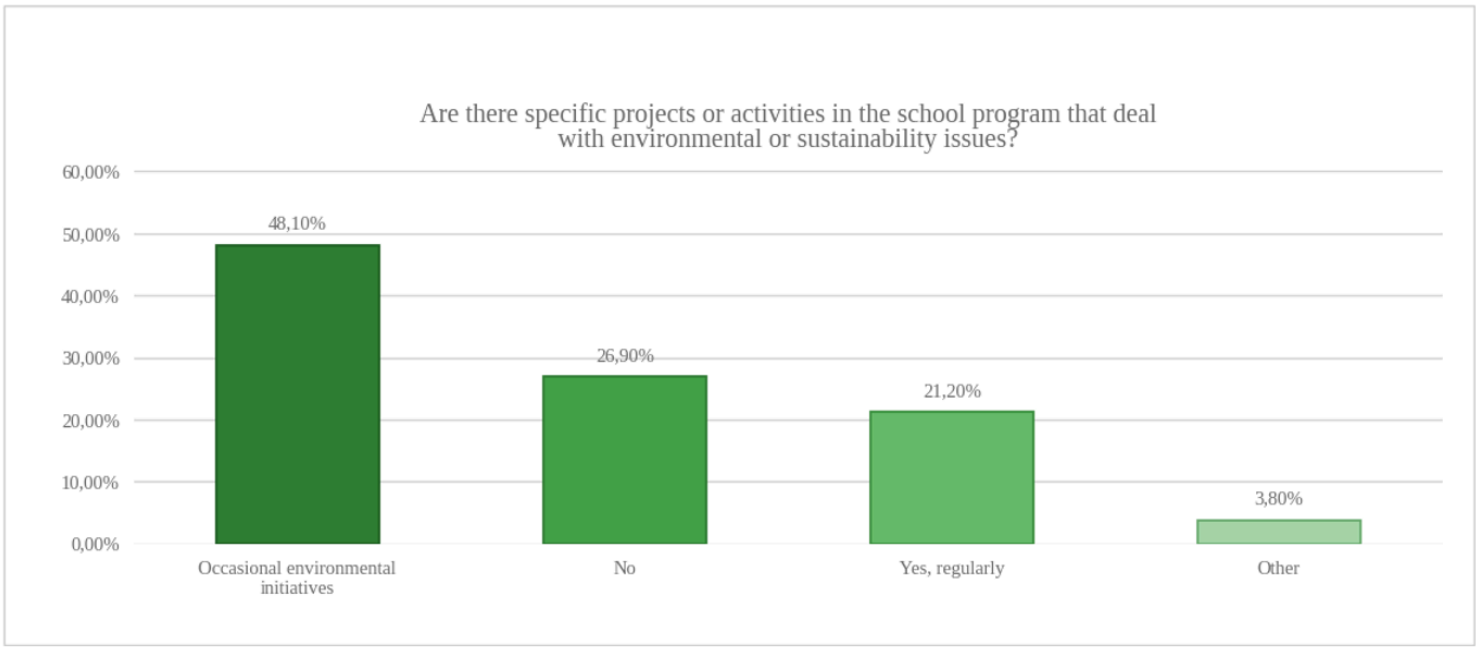

Figure 3

School-based projects and activities specifically addressing sustainability.

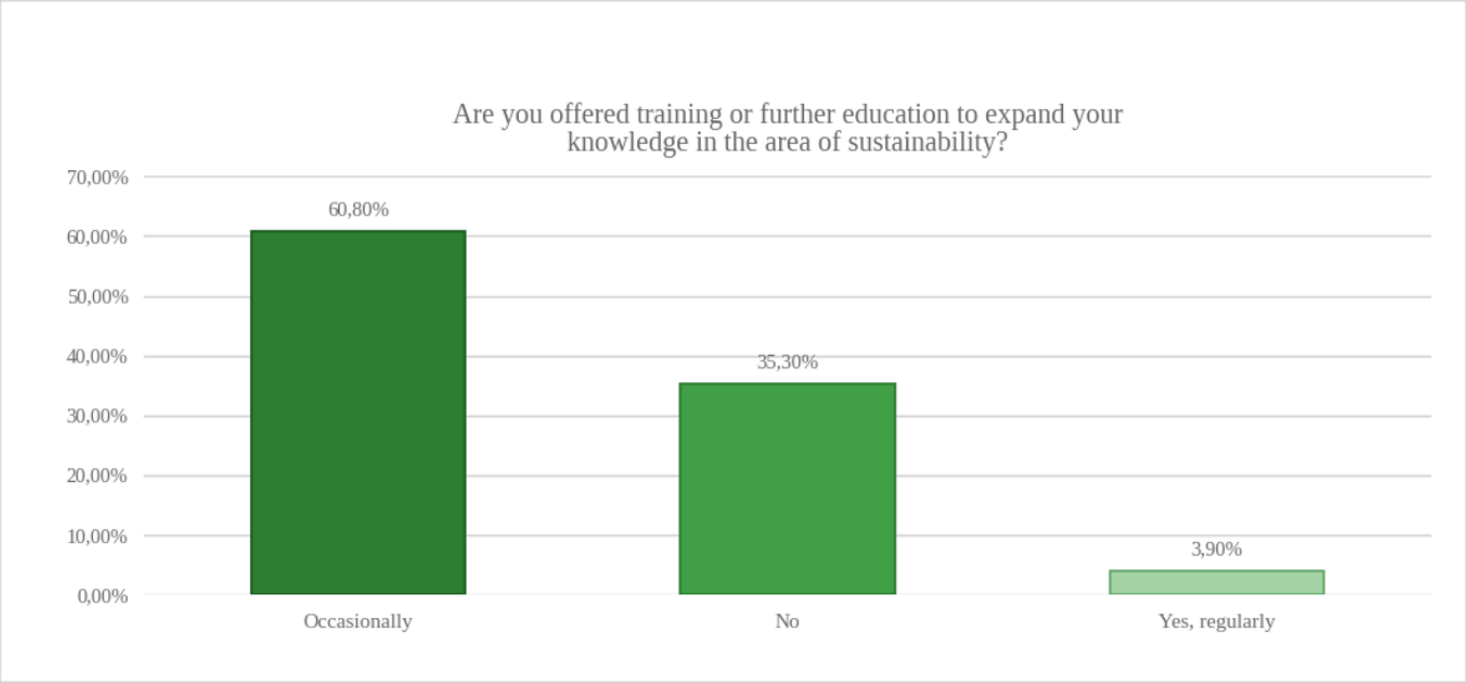

Figure 4

Availability of sustainability-related training and further education for teachers

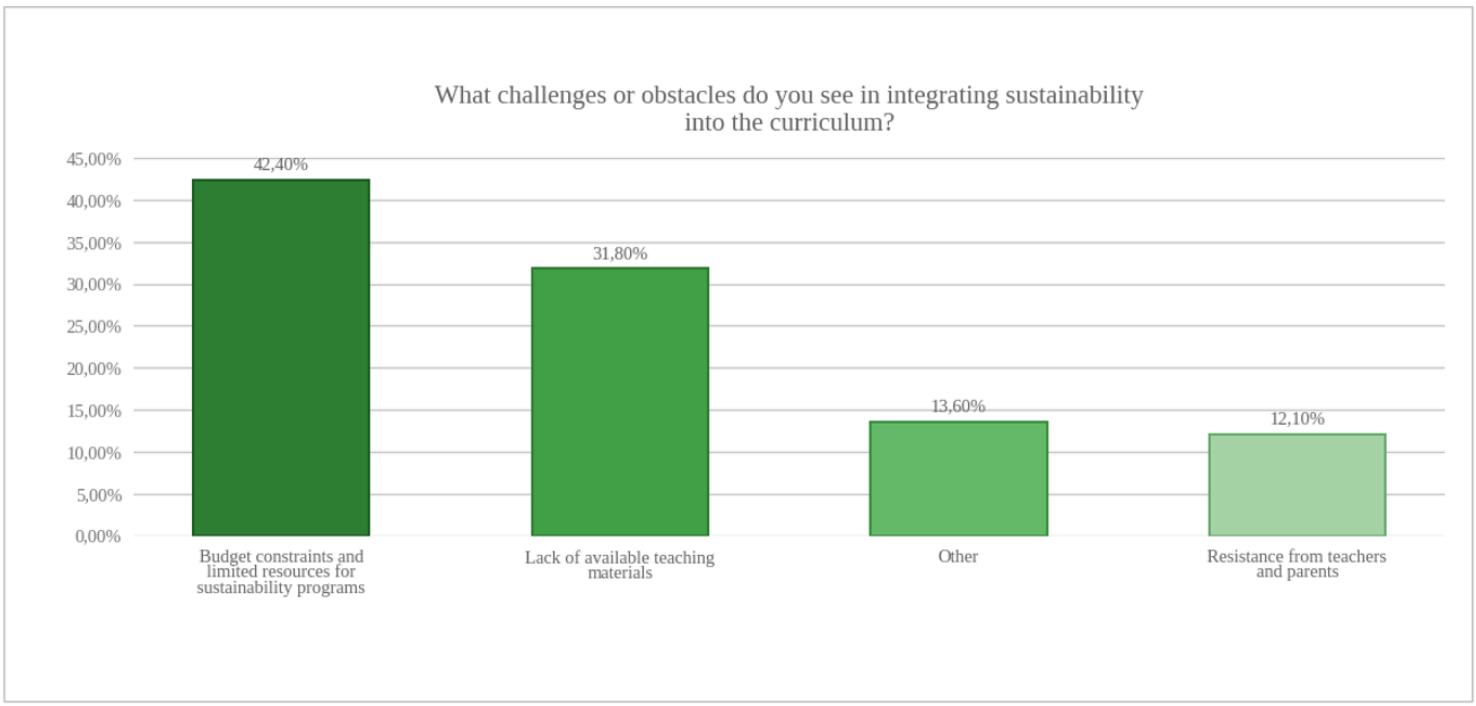

Figure 5

Challenges in integrating sustainability into the curriculum