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PRESERVICE TEACHERS' EXPECTATIONS, FEARS, AND PERCEIVED CONTRIBUTIONS AT THE START OF A COMPULSORY ENVIRONMENTAL EDUCATION COURSE: AN EXPLORATORY THEMATIC ANALYSIS

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Abstract:
This study explores the expectations, fears, and perceived contributions of fourth-year preservice teachers enrolled in a compulsory Environmental Education, Sustainability and Sustainable Development course at the Department of Education Sciences in Early Childhood, Democritus University of Thrace, Greece. At the outset of the Fall 2024 semester, 52 students responded to three open-ended questions probing what they anticipated from the course, what concerned them, and how they envisioned contributing to the learning process. The responses were analysed using reflexive thematic analysis. Regarding expectations, the most prominent themes were knowledge acquisition about environmental concepts (44.2%) and pedagogical preparedness for teaching

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environmental education to young children (36.5%), with a notable demand for experiential and interactive learning approaches (13.5%). In terms of fears, conceptual difficulty (19.2%) and assessment anxiety (19.2%) emerged as equally dominant concerns, followed by unfamiliarity with the subject domain (13.5%). Students' perceived contributions centred on active participation (48.1%), sharing ideas and opinions (19.2%), and collaborative engagement (15.4%). These findings carry implications for curriculum design in teacher education, suggesting that environmental education courses should explicitly address students' affective states, scaffold unfamiliar terminology, and embed experiential pedagogies to bridge the gap between expectations and lived learning experiences.

Keywords: environmental education; preservice teachers; expectations and fears; early childhood education; Greece

1. Introduction

Environmental education (EE) has been internationally recognised as a critical vehicle for cultivating the knowledge, attitudes, values, and competencies that societies need to confront the interconnected crises of climate change, biodiversity loss, and resource depletion (Stevenson *et al.*, 2013; UNESCO, 2017). Since the landmark Tbilisi Declaration (UNESCO, 1977) and the subsequent integration of Education for Sustainable Development (ESD) into global policy frameworks, scholars and policymakers alike have emphasised that future teachers are the primary agents through whom sustainability literacy reaches classrooms (Leicht *et al.*, 2018; Rieckmann, 2018). In Greece, however, environmental education has historically been implemented through optional extracurricular programmes rather than as a formalised curricular component, limiting both its reach and its systematic impact on learners (Goussia-Rizou & Abeliotis, 2004; Karachalios, Kalavrouziotis, *et al.*, 2023).

Initial teacher education constitutes a decisive juncture at which preservice teachers form their professional identities, pedagogical beliefs, and self-efficacy regarding specific subject domains (Darling-Hammond, 2017). Research consistently demonstrates that teachers' own knowledge, attitudes, and emotional dispositions toward environmental issues significantly shape how they implement EE in practice (Ferguson *et al.*, 2021; Karachalios & Tantaroudas, 2025). Yet the affective dimension of preservice teachers' engagement with environmental education courses - their hopes, anxieties, and sense of agency - remains comparatively under-researched, particularly in the Greek higher education context.

Several recent studies have examined what in-service and pre-service teachers know about waste management, sustainability, and environmental topics in Greece (Karachalios, Plakitsi, *et al.*, 2023; Karachalios & Tantaroudas, 2025), and how educational gaming and digital tools can foster sustainability awareness (Karachalios, 2024; Tasakou & Karachalios, 2025). However, less attention has been paid to the starting conditions of

an EE course: namely, the expectations students bring, the fears that may hinder engagement, and the resources they believe they can offer to the learning community. Understanding these initial orientations is essential for course instructors who wish to design responsive, learner-centred curricula (Armakolas *et al.*, 2019; Gomatos *et al.*, 2018).

However, in many university courses preparing future teachers, early-stage learner perspectives (what students expect, fear, and believe they can contribute) are rarely documented in a structured way, despite being directly relevant for course design. This gap matters because these perceptions can shape participation, motivation, and perceived workload from the first weeks of teaching. Evidence from such early-course reflections can therefore inform targeted pedagogical adjustments that increase engagement and reduce anxiety.

To address this, we analyse anonymous open-ended responses collected during the first teaching week of a compulsory EE course for preservice early-childhood teachers in Greece. The study provides a concise thematic map of expectations, fears, and perceived contributions that can be used as an evidence base for responsive course planning in teacher education.

The present study addresses this gap by examining the expectations, fears, and perceived contributions of 52 fourth-year preservice teachers at the beginning of a compulsory Environmental Education, Sustainability and Sustainable Development course offered in the 7th semester of the Department of Education Sciences in Early Childhood at the Democritus University of Thrace (DUTh), Greece. The following research questions guided the inquiry:

- **RQ1**: What expectations do fourth-year preservice teachers hold at the start of a compulsory environmental education course?
- **RQ2**: What fears or concerns do they express regarding the course and their participation?
- **RQ3**: How do they perceive their potential contribution to the learning process?

By answering these questions, the study contributes an evidence-based snapshot of preservice teachers' initial orientations that can be directly translated into early-course design choices (scaffolding of terminology, assessment transparency, and participatory routines) in compulsory EE teacher-education settings.

2. Literature Review

2.1 Environmental Education in Greek Teacher Preparation

Greece's relationship with environmental education has been shaped by a tension between international policy commitments and domestic implementation realities. While the nation has endorsed successive European and United Nations directives on sustainability education, the actual delivery of EE within the formal school curriculum has remained fragmented, often depending on the initiative of individual teachers and schools (Goussia-Rizou & Abeliotis, 2004). In primary and secondary education, environmental education is often operationalized through school-based programmes

rather than being systematically embedded across the curriculum, and teachers frequently report barriers and limited preparedness to address environmental topics in a genuinely cross-curricular manner (Chatzifotiou, 2005; Littledyke, 1997; Miles *et al.*, 2006; Ntona *et al.*, 2024). Research on secondary education teachers' views has revealed both positive attitudes toward environmental topics and significant knowledge gaps, particularly regarding wastewater and solid waste management (Karachalios, Plakitsi, *et al.*, 2023; Καραχάλιος, 2023).

At the university level, a handful of Greek Departments of Education have introduced compulsory EE courses, but systematic evaluation of these offerings remains scarce. The course "Environmental Education, Sustainability and Sustainable Development" (code Θ02Υ) at DUTh is one such compulsory module, located in the 7th semester and carrying 4.5 ECTS credits. It comprises two hours of theory and one hour of laboratory work per week and aims to familiarise students with the interrelationship between human societies, the environment, and sustainability, as well as with educational methods suitable for early childhood settings.

2.2 Preservice Teachers' Expectations and Fears

The constructs of expectations and fears have been productively explored in educational psychology as components of students' anticipatory affect - the emotional orientations they bring to new learning situations (Pekrun, 2006). Positive expectations (e.g., acquiring practical skills, intellectual curiosity) have been linked to higher engagement and intrinsic motivation, whereas fears (e.g., failure, incompetence, boredom) can inhibit participation and deepen surface-level learning strategies (Pekrun *et al.*, 2002).

In the domain of EE, studies on preservice teachers have identified recurring patterns. Prospective educators often expect EE courses to provide practical, classroom-ready activities and to enhance their personal environmental awareness simultaneously (Esa, 2010; Ko & Lee, 2003). At the same time, fears frequently revolve around the perceived scientific complexity of environmental topics, unfamiliarity with interdisciplinary frameworks, and doubts about one's ability to teach these subjects effectively (Álvarez-García *et al.*, 2015). A notable gap in the literature concerns non-Anglophone and Southern European contexts, where distinct cultural attitudes toward the environment and unique curricular structures may shape preservice teachers' affective experiences differently.

2.3 Experiential and Participatory Pedagogies in EE

A substantial body of evidence supports the use of experiential, participatory, and inquiry-based pedagogies in environmental education (Jensen & Schnack, 2006; Sterling, 2011). These approaches align with constructivist learning theories and have been shown to improve both cognitive and affective outcomes in EE (Evans *et al.*, 2018). In the Greek context, experiential learning has been found to be effective in enhancing sustainability awareness not only in school settings but also in corporate and vocational training environments (Armakolas *et al.*, 2019; Karachalios, 2024). Furthermore, the use of digital

tools and gamification has shown promise as a complementary strategy for promoting engagement with environmental content (Tantaroudas, McCracken, *et al.*, 2026).

Despite these advances, research on how students' initial expectations interact with experiential course designs in EE is limited. Understanding what students anticipate at the outset of a course can help educators make informed decisions about scaffolding, pacing, and the balance between theoretical and hands-on components (Karachalios & Manesis, 2025).

2.4 The Affective Dimension and Self-Efficacy in EE

Self-efficacy - the belief in one's capacity to execute behaviours necessary to produce specific outcomes (Bandura, 1977) - plays a pivotal role in how preservice teachers approach environmental education. Teachers with higher environmental self-efficacy are more likely to integrate EE into their classrooms and to persist when facing challenges (Moseley *et al.*, 2002). Research in Greece has shown that preservice teachers' self-efficacy regarding waste management topics is often low, suggesting a need for targeted interventions during initial teacher preparation (Karachalios & Tantaroudas, 2025). Understanding the fears students express at the beginning of an EE course may provide indirect insight into their self-efficacy beliefs and can guide instructors in designing confidence-building activities.

3. Material and Methods

3.1 Study Design

This study employed an exploratory qualitative design using reflexive thematic analysis to map preservice teachers' expectations, fears, and perceived contributions at the outset of a compulsory Environmental Education (EE) course.

3.2 Context and Setting

Data were collected in the course "Environmental Education, Sustainability and Sustainable Development" (code Θ02Υ), a compulsory module offered in the 7th semester of the Department of Education Sciences in Early Childhood at the Democritus University of Thrace (DUTh), Greece. The course carries 4.5 ECTS credits and comprises two hours of theory and one hour of laboratory work per week.

3.3 Participants and Recruitment

Participants were fourth-year preservice teachers who were present during the first week of the course (October 2024) and voluntarily completed an anonymous questionnaire during class time via Google Forms. Participation was optional and integrated into the learning process as a reflective activity. A total of N = 52 students provided responses. Because participation was limited to those present at that specific session, the sample represents a subset of enrolled students rather than the full cohort.

3.4 Data Collection Instrument

At the beginning of the first teaching week (October 2024), students responded to three open-ended prompts:

1) Expectations - "What do I expect from the course and from my participation in this educational process?"
2) Fears - "What am I afraid of regarding the course or my participation in it?"
3) Contribution - "How can I contribute to the course or the process?" Responses were initially produced in Greek and subsequently translated into English by the first author for reporting purposes.

3.5 Ethical Considerations

Students were informed about the purpose of the activity, the voluntary nature of participation, and the anonymous handling of responses prior to completing the questionnaire. No personal identifiers were collected. No formal ethics committee review was sought, as the activity was conducted as an anonymous, voluntary, reflective exercise embedded in the first lecture, and no personal data were collected. Data were stored and analysed in aggregated/anonymised form.

3.6 Data Analysis

Responses were analysed using reflexive thematic analysis. The two coders (authors) familiarised themselves with the dataset, generated initial codes, and iteratively developed and refined themes for each question through discussion and consensus. Because a single respondent could express multiple ideas, responses were allowed to be coded into more than one theme (multi-coding). Theme frequencies and percentages are reported descriptively to indicate how many respondents expressed content consistent with each theme; they are not intended as statistical generalisations beyond the study context. Representative excerpts are provided to illustrate each theme.

4. Results and Discussion

The thematic analysis yielded distinct sets of themes for each of the three open-ended questions. In what follows, results and discussion are interwoven to situate the findings within the relevant literature.

4.1 Expectations

Nine themes were identified in participants' responses to the expectations question. Table 1 presents these themes, along with their frequencies and percentages.

Table 1: Thematic distribution of preservice teachers' expectations (N = 52; multi-coded)

Theme	n	% of respondents
Knowledge acquisition (environmental concepts)	23	44.2
Pedagogical preparedness (teaching EE to young children)	19	36.5
Experiential/interactive learning preference	7	13.5
Practical teaching activities and resources	5	9.6
Understanding key concepts (sustainability, EE)	4	7.7
Personal environmental awareness/consciousness	4	7.7
Course enjoyment and engagement	4	7.7
Professional development (future career)	3	5.8
Assessment-related expectations	2	3.8

Note: Percentages refer to the proportion of respondents whose answers included at least one statement coded to the theme. Because responses could be assigned to multiple themes, percentages do not sum to 100%.

Here, n indicates the number of respondents whose answers included content coded to the theme (respondent-level counting).

The dominant expectation was ***knowledge acquisition*** about environmental topics and concepts: 44.2% of respondents expressed a desire to learn about the environment, environmental protection, and sustainability. Representative responses included "I expect to gain more knowledge about the environment and ways to protect it" and "I expect to be fully informed about everything concerning environmental education and sustainable development." This finding aligns with research showing that preservice teachers often approach EE courses primarily as opportunities for content knowledge development (Esa, 2010; Karachalios, Plakitsi, *et al.*, 2023).

Closely related, but distinctly oriented toward professional application, was the theme of ***pedagogical preparedness*** (36.5%): students expected to learn how to teach environmental topics to young children. Typical responses included "I hope to learn how to educate children about the importance of environmental protection and sustainability" and "I expect to learn creative activities that can be used to teach environmental education in kindergarten." The fact that more than a third of participants spontaneously linked their expectations to their future professional role as early childhood educators suggests a strong vocational orientation, consistent with findings in earlier studies on Greek teacher education (Armakolas *et al.*, 2019; Gomatos *et al.*, 2018; Karachalios & Manesis, 2025).

A noteworthy finding was the explicit preference for ***experiential and interactive learning*** (13.5%). Students stated expectations such as "experiential learning" and "I expect something more interesting and interactive, not rote memorisation." These responses reflect an awareness, even before the course begins, of the distinction between transmissive and participatory pedagogies—a distinction that is central to contemporary EE theory (Karachalios, 2024; Sterling, 2011). Other themes included the desire for practical teaching activities and resources (9.6%), understanding key concepts such as sustainability and sustainable development (7.7%), developing personal environmental consciousness (7.7%), and simply enjoying the course (7.7%).

4.2 Fears

The analysis of the fears question revealed eight thematic categories, plus a non-trivial group of students who reported no fears. Table 2 summarises these findings.

Table 2: Thematic distribution of preservice teachers' fears (N = 52; multi-coded)

Theme	n	% of respondents
Difficulty understanding concepts	10	19.2
Assessment/examination anxiety	10	19.2
Unfamiliarity with the subject domain	7	13.5
No fears expressed	6	11.5
Not meeting course demands	5	9.6
Volume of material/information overload	4	7.7
Boring or uninteresting content	4	7.7
Professional/teaching inadequacy	2	3.8
Participation/speaking anxiety	1	1.9

Note: Percentages refer to the proportion of respondents whose answers included at least one statement coded to the theme. Because responses could be assigned to multiple themes, percentages do not sum to 100%.

Here, n indicates the number of respondents whose answers included content coded to the theme (respondent-level counting).

Two themes shared the highest prevalence: ***difficulty understanding concepts*** and ***assessment/examination anxiety*** (both 19.2%). Students worried about failing to grasp terminology related to sustainability and sustainable development ("I worry that I won't understand certain concepts such as sustainability and viable development [sustainable development]") and about exam performance ("Failure in the exam period"; "What scares me is whether I will manage to pass the course"). These concerns mirror findings from the broader achievement emotions literature, which highlights how academic anxiety can undermine deeper learning (Pekrun *et al.*, 2002). They also echo prior research indicating that Greek students and teachers often find sustainability-related terminology abstract and challenging (Karachalios & Tantaroudas, 2025; Καραχάλιος, 2023).

The theme of ***unfamiliarity with the subject domain*** (13.5%) is particularly noteworthy. Students reported that the course represented their first encounter with EE ("It is my first contact with this"; "I have never attended a similar course before, so I am afraid of the unknown"). This reveals a structural feature of the curriculum: because EE is compulsory only in the 7th semester, students arrive with no prior formal preparation in the field. This finding has practical implications, as it suggests that instructors should invest time at the beginning of the course in establishing foundational concepts and building students' confidence (Darling-Hammond, 2017).

It is encouraging that 11.5% of students explicitly stated that they had ***no fears***. Smaller but significant clusters of fears related to the volume of material (7.7%), the possibility of boring content (7.7%), and not meeting the course demands (9.6%). Two students expressed fears about their future ***professional/teaching inadequacy***—specifically, about not being able to transmit environmental knowledge effectively to

young children. This fear connects directly to self-efficacy theory (Bandura, 1977) and resonates with recent findings on Greek preservice teachers' low self-efficacy in waste management education (Karachalios & Tantaroudas, 2025).

4.3 Perceived Contributions

The third question asked students how they believed they could contribute to the course. The responses revealed a predominantly receptive but willing orientation. Table 3 presents the results.

Table 3: Thematic distribution of preservice teachers' perceived contributions (N = 52; multi-coded)

Theme	n	% of respondents
Active participation	25	48.1
Sharing ideas and opinions	10	19.2
Collaboration with peers	8	15.4
Discussion engagement	6	11.5
Existing knowledge sharing	5	9.6
Experiential contribution (experiments, field visits)	4	7.7
Positive attitude and disposition	4	7.7
Uncertainty about how to contribute	3	5.8

Note: Percentages refer to the proportion of respondents whose answers included at least one statement coded to the theme. Because responses could be assigned to multiple themes, percentages do not sum to 100%.

Here, n indicates the number of respondents whose answers included content coded to the theme (respondent-level counting).

The most frequent response was a general commitment to ***active participation*** (48.1%), expressed through phrases such as "with my participation" and "by actively participating in the educational process." While the willingness to participate is a positive indicator, the relative vagueness of many of these responses suggests that students may not yet have a clear picture of what active engagement in an EE course entails. More specific contributions included sharing ideas and opinions (19.2%), collaboration with peers (15.4%), and engaging in discussions (11.5%). These themes align with the participatory and dialogical approaches advocated in contemporary EE literature (Jensen & Schnack, 2006; Wals, 2011).

A small group of students (7.7%) envisioned more concrete ***experiential contributions***, such as "I would like to contribute in a more experiential way through experiments or visits, e.g. to a planetarium" and "Perhaps I could contribute with ideas and personal experiences related to education, through a project, for example." These responses suggest that some students already possess an intuitive understanding of constructivist and experiential learning models even before formal instruction (Sterling, 2011). Finally, 5.8% of students expressed ***uncertainty about how they could contribute*** ("The truth is I don't know; I hope to find out along the way"), highlighting the

importance of clearly communicating course expectations and co-constructing learning norms at the beginning of the semester.

4.4 Cross-Cutting Themes

Examining the three datasets together reveals important cross-cutting patterns. First, there is a clear tension between expectations of knowledge acquisition and fears of conceptual difficulty. Students want to learn about environmental topics, but simultaneously worry about the complexity of the material. This pattern suggests a need for careful scaffolding and the explicit use of formative assessment strategies to track and support student understanding throughout the course (Black & Wiliam, 2009).

Second, the strong desire for experiential learning (expressed in expectations) and the fear of boring, purely theoretical content (expressed in fears) together point to a clear student preference for active, participatory pedagogies. This preference is well-supported by the EE literature and has practical implications for course design (Armakolas *et al.*, 2019; Karachalios, 2024). The use of gamified activities, digital tools, and technology-enhanced learning could be effective strategies to address these preferences (Karachalios, 2024; Tasakou & Karachalios, 2025).

Third, the vocational orientation evident in students' expectations—the desire to learn how to teach EE to young children—is not consistently matched by their perceived contributions, which tend to remain general and non-specific. This gap suggests that at the start of the course, students possess motivation but lack the pedagogical content knowledge to envision their specific role in a participatory EE classroom. Building this capacity should be a key pedagogical goal of the course (Karachalios & Manesis, 2025; Karachalios & Tantaroudas, 2025).

5. Recommendations

Based on the findings of this study, the following recommendations are proposed for the design and delivery of compulsory environmental education courses in teacher education programmes:

5.1 Scaffolding Unfamiliar Concepts

Given that nearly one in five students feared conceptual difficulty and 13.5% reported unfamiliarity with the EE domain, course instructors should begin with accessible, everyday examples before introducing more abstract sustainability frameworks. Concept mapping, collaborative glossary-building, and pre-reading materials can help demystify terminology (Karachalios, Plakitsi, *et al.*, 2023; Καραχάλιος, 2023).

5.2 Embedding Experiential Pedagogies

The explicit student preference for experiential and interactive learning validates the integration of hands-on activities, field visits, creative projects, and community-based learning into EE course design. Such approaches have been shown to enhance both

knowledge retention and affective engagement (Karachalios & Manesis, 2025; Sterling, 2011).

5.3 Addressing Assessment Anxiety

The high prevalence of examination-related fears calls for transparent assessment criteria, formative assessment checkpoints, and diverse assessment formats (e.g., portfolios, reflective journals, group presentations) that reduce the pressure associated with high-stakes examinations (Black & Wiliam, 2009).

5.4 Leveraging Digital and Gamified Tools

The incorporation of digital platforms and age-appropriate gamified activities can respond to students' preference for interactive engagement while supporting participation and collaboration. Where feasible, simple digital tools (e.g., collaborative documents, short interactive quizzes, and media-based micro-tasks) can be used to scaffold unfamiliar terminology and maintain attention without increasing cognitive overload, while more advanced AI-supported systems can inform the design of adaptive awareness and feedback workflows in educational contexts (Karachalios, 2024; Tantaroudas, Karachalios, *et al.*, 2026; Tantaroudas, McCracken, *et al.*, 2026).

5.5 Strengthening Teacher Self-Efficacy

Given the evidence of low professional self-efficacy, courses should include microteaching, peer observation, and real-world EE project design to build students' confidence in their ability to deliver environmental education in kindergarten settings (Karachalios & Tantaroudas, 2025).

5.6 Curriculum Integration

These findings further support the call for environmental education to be embedded earlier and more systematically within teacher preparation curricula, rather than being confined to a single compulsory course in the final year (Rieckmann, 2018; UNESCO, 2017).

6. Conclusion

This exploratory thematic analysis has mapped the expectations, fears, and perceived contributions of 52 fourth-year preservice teachers at the beginning of a compulsory Environmental Education, Sustainability and Sustainable Development course in Greece. The findings reveal that students arrive with a strong desire for both environmental knowledge and pedagogical preparedness, a clear preference for experiential over transmissive learning, and a mix of conceptual and assessment-related anxieties. Their perceived contributions, while enthusiastic, remain largely non-specific, suggesting that the course itself must serve as a space where active, participatory roles are modelled and practised.

These initial affective and cognitive orientations carry significant implications for how EE courses are designed, delivered, and evaluated in the context of teacher education. By attending to students' starting points - their hopes, concerns, and readiness - educators can create more responsive and effective learning environments that cultivate not only environmental literacy but also the confidence and pedagogical skill needed to bring sustainability education into early childhood classrooms (Karachalios & Manesis, 2025; Karachalios & Tantaroudas, 2025).

Limitations of this study include its single-institution, single-cohort design, which limits generalisability. The relatively short open-ended responses, while rich, do not allow for the depth of understanding achievable through interviews or focus groups. Because responses were originally written in Greek and translated into English for reporting, some nuance may have been lost despite careful translation.

Future research could adopt longitudinal designs that track how students' expectations and fears evolve throughout the course, employ mixed methods approaches to triangulate qualitative and quantitative data, and compare findings across multiple institutions and national contexts. Furthermore, investigating how the integration of immersive and data-driven digital tools (Tantaroudas, McCracken, *et al.*, 2026) affects the trajectory of students' expectations and fears would represent a promising direction for future inquiry.

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Ethics Statement
Participation was voluntary and anonymous. Students were informed about the purpose of the activity and provided informed consent prior to responding. No personal identifiers were collected.

Data Availability
The qualitative responses analysed in this study are not publicly available to protect participant anonymity. An anonymised version of the dataset (and a brief codebook) can be made available by the corresponding author upon reasonable request.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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