

Short Communication: FROM ENVIRONMENTAL EDUCATION TO OCEAN LITERACY: TWO DECADES OF YOUTH AWARENESS IN ROMANIA

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ABSTRACT

This study evaluates the evolution of ocean literacy among Romanian youth over the past 20 years, emphasizing shifts in perception, awareness, and behavioral patterns in relation to marine ecosystems. Drawing from extensive data collected through structured questionnaires distributed between 2004 and 2024, the research identifies key areas of growth and remaining gaps in ocean literacy. We investigate how both formal curricula and informal educational initiatives have shaped attitudes towards marine conservation, pollution, and sustainability. The findings reveal significant improvements in conceptual knowledge and concern for environmental protection, yet highlight the continuing challenge of translating awareness into active engagement.

Keywords: ocean literacy, environmental education, marine awareness, youth engagement

INTRODUCTION

At the beginning of the 21st century, Romania's environmental education system reflected the broader transitional dynamics of a post-communist society striving to align with European standards. Educational priorities were undergoing reform, but environmental topics—especially those concerning marine ecosystems—remained peripheral. Curricula in primary and secondary schools offered limited content on oceans or coastal environments, despite Romania's direct access to the Black Sea. Environmental education was often fragmented, delivered through isolated school projects, sporadic NGO involvement, or extracurricular activities rather than through a cohesive national strategy. The term *ocean literacy*—which encompasses understanding the ocean's influence on people and people's influence on the ocean—was virtually absent from public discourse, policy documents, and educational materials (Jefferson *et al.*, 2015).

The early 2000s brought gradual change. Romania's accession to the European Union in 2007 acted as a catalyst for reform in multiple sectors, including education and environmental governance. Integration into EU frameworks introduced new environmental directives, funding opportunities, and collaborative projects that elevated the importance of sustainability in the public sphere. Global campaigns—most notably the United Nations' Decade of Ocean Science for Sustainable Development (2021–2030) and the '30x30' initiative aimed at protecting 30% of the planet's land and oceans by 2030—further amplified the relevance of marine conservation on the international stage. These movements created ripple effects that began to influence national policies and civil society activities.

In response, local actors began to fill the gap left by formal education. Non-governmental organizations and grassroots movements launched initiatives aimed at educating Romanian youth about marine ecosystems, biodiversity, climate change, and sustainable practices. Coastal clean-up events, online awareness campaigns, and marine biology workshops became increasingly common. Several schools partnered with international programs or NGOs to introduce students to ocean-related topics through interactive learning methods (Easman *et al.*, 2018).

Despite these encouraging developments, challenges remain. Ocean literacy in Romania is still in a formative phase, with varying levels of access and implementation across urban and rural areas. National curricula continue to underrepresent marine issues, and teacher training in this domain is limited.

This study aims to chronicle the evolution of marine environmental awareness in Romania by analyzing comparative data from the past two decades. It evaluates how knowledge, attitudes, and actions related to ocean literacy have changed within the educational context, considering both formal and informal avenues of learning. Through this analysis, the study seeks to highlight the progress made, the influence of international frameworks, and the ongoing gaps that must be addressed to foster a more ocean-literate generation in Romania.

MATERIALS AND METHODS

This study employed a comparative survey design to assess changes in ocean literacy and marine environmental awareness in Romania over a 20-year period. Data were collected through structured questionnaires administered to high school students, university students, and educators across multiple regions of the country.

The first data set, gathered in 2004, comprised responses from approximately 450 participants across six counties in Romania, representing a diverse mix of urban and rural areas. In contrast, the 2024 survey expanded both in scale and geographic reach, involving over 800 respondents from ten counties, selected to reflect regional diversity and demographic variation.

The questionnaires combined both closed- and open-ended items and were organized around key thematic areas:

- Knowledge of marine threats (e.g., pollution, biodiversity loss, climate-related impacts)
- Engagement in conservation practices (e.g., beach clean-ups, plastic reduction, advocacy)
- Educational resources utilized (e.g., textbooks, digital media, NGO-led initiatives)
- Perceptions of policy relevance and international initiatives (e.g., EU marine policy, UN campaigns) (Gelcich *et al.*, 2015).

In addition to thematic content, the surveys gathered demographic information including age, gender, education level, and geographic location. This allowed for

analysis of trends across different subgroups, offering insights into how ocean literacy varies by region, age cohort, and educational background.

The longitudinal and comparative nature of the study provides a framework for evaluating both the progress made and the persistent gaps in marine environmental education in Romania.

RESULTS AND DISCUSSION

Over the past two decades, knowledge of marine environmental issues among Romanian students has evolved markedly. In 2004, student awareness was largely shaped by local concerns, with a strong emphasis on industrial pollution and nutrient runoff leading to eutrophication in coastal and inland waters. In contrast, by 2024, students exhibited a broader and more nuanced understanding of complex, global marine issues, including ocean acidification, invasive species, and climate-induced deoxygenation—topics that were virtually absent from discourse two decades prior. This shift in awareness is captured in Table 1, which compares students’ familiarity with key marine environmental issues in 2004 and 2024:

Table 1. Comparison of Awareness of Key Marine Issues (2004 vs. 2024)

Issue	2004 Awareness	2024 Awareness
Eutrophication	High	Moderate
Microplastics	Low	High
Climate Change	Low	High
Biodiversity Loss	Low	High
Marine Debris	Moderate	High

The growing awareness of issues like microplastics and biodiversity loss reflects the influence of global media, digital education tools, and increased environmental advocacy within both formal and informal learning spaces. However, this cognitive shift has not always translated into consistent behavioral change. Environmental actions reported by students in 2024 reveal a strong inclination toward accessible, individual-level behaviors. The majority reported recycling (82%) and avoiding single-use plastics (69%), while fewer engaged in actions requiring sustained commitment or civic engagement, such as supporting environmental groups (27%) or choosing sustainable seafood (31%).

This discrepancy underscores an important gap between awareness and action. While students increasingly recognize the urgency of marine environmental issues, engagement in systemic solutions—such as policy advocacy, citizen science, or marine conservation volunteering—remains limited.

Moreover, the study found that while students identified gamified learning platforms, virtual reality experiences, and environmental documentaries as effective tools for deepening engagement, these resources were reported as underutilized in formal classroom settings. This indicates a missed opportunity within the educational

system to harness innovative methods for fostering not only knowledge acquisition but also meaningful behavioral change.

The data confirms a measurable improvement in both factual knowledge and personal concern for marine issues. However, a key barrier remains the disconnect between knowledge and action. Teachers identified the absence of a standardized national curriculum on ocean literacy as a major limitation. Funding constraints and insufficient teacher training further hamper consistent implementation. An important insight is the role of informal education and digital engagement. Platforms like YouTube, Instagram, and TikTok have become unexpected vehicles for environmental awareness, often reaching students more effectively than traditional lessons. Nevertheless, this form of learning risks being superficial without guided reflection and deeper engagement. Institutional efforts must aim not only at informing, but at motivating and enabling action. Integrating ocean literacy into core subjects, developing community-based projects, and reinforcing policy education can help address these gaps.

CONCLUSIONS

Romania's youth demonstrate a growing awareness of ocean health, supported by two decades of educational evolution. Formal curricula, NGOs, and global movements have successfully raised consciousness about marine conservation. Yet the next challenge lies in consistent, meaningful action. By fostering interdisciplinary approaches and prioritizing behavioral education, Romania can continue building a generation of ocean-literate citizens ready to engage in sustainable practices.

REFERENCES

- Easman, E.S., Abernethy, K.E., & Godley, B.J. (2018). Assessing public awareness of marine environmental threats and conservation efforts. *Marine Policy*, 87, pp.234–240
- Gelcich, S., Buckley, P., Pinnegar, J.K., Chilvers, J., Lorenzoni, I., Terry, G., & Duarte, C.M. (2015). Marine environmental contamination: Public awareness, concern and perceived effectiveness in five European countries. *Environmental Research*, 143, pp.62–70.
- Jefferson, R.L., Bailey, I., Laffoley, D., Richards, J.P., & Attrill, M.J. (2015). Public awareness of marine environmental issues in the UK. *Marine Policy*, 39, pp.11–17.