Vol. 16, No. 1/2026

Journal of Danubian Studies and Research

The Transformative Role of Education for Sustainable Development in Building Resilient Societies

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Abstract: Contemporary societies face increasingly interconnected environmental, social, economic and geopolitical challenges, including climate change, environmental degradation, social inequalities, technological disruption and armed conflicts. These challenges demonstrate that resilience depends not only on material resources and institutional capacity, but also on the capacity of individuals and communities to learn, adapt and act collectively. In this context, Education for Sustainable Development (ESD) represents an important component of contemporary educational policy and practice. ESD extends beyond the transmission of knowledge by developing competencies, values and attitudes that enable learners to understand complex systems, anticipate possible futures, evaluate alternative courses of action and participate in collective problem-solving. This paper examines the contribution of ESD to resilient societies through a conceptual and narrative review of relevant academic literature and international policy documents. Particular attention is given to sustainability competencies, transformative learning and action competence as mechanisms connecting education with individual and collective resilience. The analysis indicates that systems thinking, anticipatory

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thinking, normative reasoning, strategic competence and interpersonal competence are particularly relevant to resilience-building. At the same time, the transition from knowledge to action requires learning environments that provide opportunities for critical reflection, participation, collaboration and real-world problem solving. The paper argues that ESD should not be treated as an additional curriculum topic, but as a transformative educational approach that can strengthen individual agency, institutional capacity and community resilience. Its contribution, however, is conditional upon teacher preparation, inclusive access to quality education, supportive institutional environments and opportunities for meaningful participation. The paper concludes that education becomes a strategic resource for resilient societies when it connects knowledge with agency and individual learning with collective action.

Keywords: Education for Sustainable Development; Resilient Societies; Sustainable Development Goals

1. Introduction

The contemporary world is characterized by a growing interaction between environmental, social, economic and geopolitical challenges. Climate change, biodiversity loss, environmental degradation, social inequality, public health crises, technological disruption and armed conflicts increasingly generate risks that cannot be addressed through isolated interventions (Vădineanu, 2001).

The *2030 Agenda for Sustainable Development* explicitly recognizes these interdependencies and presents sustainable development as an integrated framework encompassing economic, social and environmental dimensions (United Nations, 2015). This context has strengthened the importance of resilience as a concept describing the capacity of individuals, communities and institutions to respond to disruption and uncertainty. Resilience should not be understood merely as the capacity to return to a previous state. In conditions of persistent change, it also involves learning, adaptation and, when necessary, transformation. Societies therefore require not only infrastructure and institutional capacity, but also citizens capable of understanding complexity, evaluating information, anticipating consequences and cooperating in the search for solutions (Vădineanu et al., 1998). Education is central to these processes because resilience is closely connected with learning. Educational systems shape the knowledge, competencies, values and forms of participation through which individuals interpret and respond to social and environmental change. Education can consequently contribute to resilience not only by transmitting information but also by developing the capacity to think critically, cooperate, and make decisions and act. Education for Sustainable Development (ESD) is particularly relevant to this perspective. UNESCO (2017) defines ESD in

terms of empowering learners with knowledge, skills, values and attitudes that enable them to contribute to sustainable development and to make informed decisions for environmental integrity, economic viability and social justice. This approach places learners in an active rather than passive position and connects education with the capacity to participate in sustainability transitions. The international policy relevance of ESD is reflected in Sustainable Development Goal 4 and, particularly, Target 4.7, which calls for learners to acquire knowledge and skills related to sustainable development, sustainable lifestyles, human rights, gender equality, peace, global citizenship and cultural diversity (United Nations, 2015).

UNESCO's *Education for Sustainable Development: A Roadmap* subsequently emphasized five priority areas: policy, learning environments, educator capacity, youth empowerment and local action (UNESCO, 2020). ESD is therefore increasingly understood as an instrument of individual and societal transformation rather than as a separate curricular topic. The present paper examines the relationship between ESD and societal resilience, with particular attention to the mechanisms through which education may contribute to individual agency, collective capacity and institutional adaptation. The central argument is that the transformative potential of ESD lies in its ability to connect knowledge with competence, competence with agency and agency with meaningful action.

2. Conceptual and Methodological Approach

This paper adopts a conceptual and narrative literature review approach. The objective is not to estimate a pooled statistical effect of ESD, but to integrate theoretical, empirical and policy-oriented contributions concerning the relationship between sustainability education and resilience. The analysis draws on three complementary bodies of literature. The first concerns sustainability competencies, particularly the framework proposed by Wiek et al. (2011). The second addresses transformative learning and sustainability education, including the systematic review of Rodríguez and Barth (2020). The third concerns empirical evidence on action competence, community resilience and educational practice, including recent work by Sziva et al. (2026) and Fu & Zhang (2024). International policy documents published by UNESCO and the United Nations are used to situate these academic contributions within the broader framework of the Sustainable Development Goals and ESD for 2030 (UNESCO, 2017, 2020; United Nations, 2015).

The analysis is organized around a central conceptual relationship:

ESD → sustainability competencies → action competence and agency → individual and collective action → learning and adaptation → resilience.

This model is used as an analytical framework rather than as a deterministic causal model. Literature does not justify the assumption that participation in ESD automatically produces resilient societies. Educational outcomes depend on institutional conditions, social context, opportunities for participation and broader public policy.

3. Education for Sustainable Development, Competencies and Resilience

3.1. From Knowledge Transmission to Transformative Learning

A defining characteristic of ESD is the movement from education *about* sustainability towards education *for* sustainability. Knowledge remains essential, but knowledge alone is insufficient when learners are confronted with problems characterized by uncertainty, competing interests and ethical dilemmas. UNESCO (2017) emphasizes that sustainability-oriented education should develop knowledge, skills, values and attitudes and should empower learners to make informed decisions and act responsibly. This approach implies a transformation in the role of the learner: from recipient of information to participant in processes of change. The concept of transformative learning provides a useful theoretical basis for understanding this shift. Mezirow (1997) conceptualized transformative learning as a process involving critical reflection on established assumptions and frames of reference. In sustainability education, such reflection may concern assumptions about consumption, development, human-environment relationships, responsibility or social justice. Rodríguez and Barth (2020), reviewing the literature on transformative learning in sustainability education, found that transformative processes are associated with experiential and social learning, critical reflection and the development of sustainability competencies. Their review also cautions against using the concept of transformation superficially.

Educational activity does not become transformative simply because sustainability is included as a topic. Transformation requires meaningful engagement with complexity, alternative perspectives and action. Consequently, effective ESD should create learning environments in which students can investigate authentic problems, discuss different interpretations, reflect on their own assumptions and consider possible responses. The process can be conceptualized as a dynamic relationship

between knowledge, reflection, competence and action, rather than as a linear accumulation of information.

3.2. Sustainability competencies

The competency perspective provides a particularly strong connection between ESD and resilience. Wiek et al. (2011) identify five key sustainability competencies: systems-thinking, anticipatory, normative, strategic and interpersonal competence.

Table 1. Sustainability Competencies and Their Relevance to Societal Resilience

Sustainability competency	***Educational function***	***Relevance to resilience***
Systems-thinking	Understanding interdependencies and feedback	Helps identify complex and cascading risks
Anticipatory	Exploring possible, probable and desirable futures	Supports preparedness and adaptation
Normative	Examining values, justice and desirable futures	Supports equitable responses
Strategic	Designing and implementing interventions	Connects knowledge with practical action
Interpersonal	Communicating, cooperating and negotiating	Strengths collective problem-solving

Source: adapted conceptually from Wiek et al. (2011)

Systems-thinking competence is relevant because contemporary sustainability problems are interconnected. Climate change, for example, can affect food systems, health, migration, infrastructure and economic stability. Understanding these interactions enables learners to move beyond isolated explanations and to recognize possible cascading effects. Anticipatory competence concerns the capacity to explore alternative futures. Resilient societies require citizens and institutions capable of considering uncertainty and preparing for possible developments rather than responding only after disruption occurs (Wiek et al., 2011). Normative competence introduces the ethical dimension of sustainability. Adaptation or development strategies may produce unequal benefits and costs. Consequently, resilience needs to be considered not only in terms of survival and adaptation but also in terms of equity and social justice. Strategic competence concerns the ability to move from diagnosis to intervention. It is particularly relevant to action-oriented educational approaches in which learners develop and implement responses to real problems. Finally, interpersonal competence is essential because sustainability challenges cannot be addressed individually. Communication, collaboration,

negotiation and conflict management support the collective processes through which communities respond to disruption. Taken together, these competencies indicate that resilience is partly a human and educational capacity. Societies are better positioned to respond to uncertainty when citizens can understand systems, consider alternative futures, evaluate values, develop strategies and cooperate with others.

3.3. From Knowledge to Action

One of the persistent challenges in sustainability education is the gap between knowledge and behavior. Environmental knowledge does not necessarily result in sustainable behavior. Individuals may recognize the existence of a problem while lacking either the perceived capacity or the opportunity to act. Recent evidence strengthens the relevance of action competence in this context. Sziva et al. (2026) examined 6,477 secondary-school students in Hungary, Czechia and Slovakia and investigated the relationships between perceived ESD experiences, action competence and pro-environmental behavior. Their findings indicate that intention to act was the most consistent predictor of pro-environmental behavior and that action competence mediated relationships between perceived ESD quality and behavior. These findings have important implications for resilience. If education is expected to contribute to the capacity of individuals and communities to respond to sustainability challenges, it must provide more than information. Learners need opportunities to develop a sense of efficacy, understand possible courses of action and participate in decisions that affect their immediate environment. For example, a student may understand the environmental consequences of excessive energy consumption but remain passive if the educational institution offers no opportunity to influence energy use. By contrast, participation in an energy audit followed by the development and implementation of a school-level intervention can transform knowledge into experience and agency. The knowledge-action relationship is therefore strongly influenced by educational context. ESD becomes more transformative when learners are treated as participants capable of influencing real situations.

4. From Individual Competence to Community and Institutional Resilience

The contribution of ESD to resilience becomes particularly significant when individual competencies are connected to collective contexts. Resilient communities require knowledge and preparedness, but also communication, trust, social networks and the capacity to coordinate responses. Schools and universities are important actors in this process because they are embedded in communities. They bring together learners, educators, families and other social institutions and can provide spaces for cooperation and problem-solving. Evidence from disaster education illustrates this relationship. Fu & Zhang (2024) conducted a systematic review of community-based disaster education interventions and analyses 47 studies. Their findings emphasize the importance of teacher resilience and well-being for effective community-based disaster education. The study therefore highlights a dimension that is sometimes overlooked in discussions of educational resilience: the resilience of educators themselves. Teachers are not simply curriculum implementers. They can function as facilitators of dialogue, sources of reliable information, organizers of community learning and mediators between educational institutions and local stakeholders. Their professional capacity and well-being can consequently influence the ability of educational institutions to contribute to community resilience (Fu & Zhang, 2024). This perspective is consistent with the broader ESD framework proposed by UNESCO (2020), which places educator capacity and transformation of learning environments among the central priorities of ESD for 2030. The institutional dimension is equally important. If sustainability is treated exclusively as a subject taught in classrooms, a contradiction may arise between what students learn and what they experience in their educational environment. A whole-institution approach seeks greater coherence between curriculum, pedagogy, governance, institutional operations, research and community engagement (UNESCO, 2020). Educational institutions can consequently become environments in which sustainability is practiced. A school that teaches responsible consumption can also examine its own procurement, energy use and waste-management practices.

A university can connect sustainability education with research, campus management and partnerships with local authorities. Such approaches create opportunities for students to observe how individual decisions interact with institutional structures. Real-world learning is particularly important in this context. Brundiers et al. (2010) argue that project-based learning, problem-based learning, service learning and internships can provide authentic environments for developing

sustainability competencies. These approaches allow learners to encounter real constraints, interact with stakeholders and experience the complexity of decision-making.

The relationship between individual and collective resilience can therefore be expressed as:

Individual competence → agency → participation → institutional and community capacity → resilience.

The process is not automatic, but it indicates why ESD should be understood as more than individual environmental awareness.

5. Educational Conditions and Implications for Resilient Societies

The literature suggests that the transformative potential of ESD depends on several interconnected educational conditions. First, sustainability education needs to be interdisciplinary. Environmental and social challenges do not conform to disciplinary boundaries. Climate change, for example, involves scientific, economic, political and ethical dimensions. Interdisciplinary learning can help students integrate these perspectives and develop system-thinking competence. Second, ESD benefits from experiential and problem-oriented pedagogies. Project-based, problem-based and community-based learning can provide opportunities to connect theory with action. Brundiers et al. (2010) show the relevance of real-world learning for developing sustainability competencies, particularly problem-solving and collaboration. Third, learners require opportunities for critical reflection and dialogue. Sustainability questions frequently involve different interests and values. Education should therefore develop the capacity to examine evidence, consider alternative perspectives and engage constructively with disagreement rather than simply transmit predetermined conclusions. Fourth, teacher preparation is fundamental. Teachers require knowledge of sustainability as well as appropriate pedagogical strategies for interdisciplinary and action-oriented learning. The evidence concerning teacher resilience in disaster education further indicates that professional well-being should be treated as part of resilience-building rather than as a secondary issue (Fu & Zhang, 2024). Fifth, ESD must be inclusive. The capacity to respond to crises is unequally distributed, and educational inequality can reproduce existing vulnerabilities. The commitment of the 2030 Agenda to inclusive development and to leaving no one behind therefore has direct implications for ESD (United Nations, 2015). Sixth, assessment needs to move beyond the exclusive

measurement of factual knowledge. If the objective of ESD is to develop sustainability competencies and agency, assessment should also consider critical thinking, problem-solving, collaboration, reflection and the ability to apply knowledge in authentic situations. These conditions suggest that ESD is most effective when it is embedded in the broader culture of an educational institution.

UNESCO (2020) accordingly places transformation of learning environments alongside policy, educator capacity, youth empowerment and local action. The broader policy implication is that ESD should be integrated into educational strategies rather than treated as an optional addition. SDG 4.7 provides an international framework for this integration, while ESD for 2030 provides a more detailed implementation orientation (UNESCO, 2017, 2020; United Nations, 2015).

6. Discussion and Conclusion

The literature reviewed in this paper supports the argument that ESD can contribute to resilient societies primarily through capacity building. Education does not directly eliminate climate change, inequality, environmental degradation or geopolitical instability. Its contribution is more indirect but nevertheless strategic: it develops the human capacities through which societies understand problems, deliberate about alternatives and organize responses. At the individual level, ESD can strengthen knowledge, critical reflection, sustainability competencies and action competence. At the institutional level, it can encourage educational organizations to become environments in which sustainability is practiced. At the community level, education can contribute to preparedness, communication, participation and collective problem-solving. The connection between these levels is particularly important. Sustainability competencies have little transformative value if learners have no opportunity to apply them. Conversely, participation without adequate knowledge and reflection may result in poorly informed action. The contribution of ESD therefore lies in bringing together knowledge, competence, agency and action.

The conceptual relationship developed in this paper can be summarized as:

ESD → knowledge and awareness → sustainability competencies → critical reflection and values → action competence → individual and collective agency → institutional and community action → learning, adaptation and resilience.

This pathway should not be interpreted as a deterministic causal chain. The effects of ESD depend on educational quality, institutional support, teacher capacity, social

context and opportunities for participation. Moreover, education cannot substitute for structural policy interventions. Sustainable and resilient societies also require appropriate governance, infrastructure, economic policies and social protection. Further consideration concerns the meaning of resilience itself. If resilience is interpreted merely as the capacity to return to an existing state, education may be reduced to prepare individuals to cope with disruption. A broader interpretation recognizes that persistent change may require transformation. Sterling (2010) argues that sustainability education should consider the relationship between learning and resilience and should develop learners capable of responding constructively to social-ecological change. This perspective is consistent with UNESCO's broader vision of education as a foundation for cooperation, solidarity and collective action in uncertain futures (International Commission on the Futures of Education, 2021). It also reinforces the importance of understanding resilience as both an individual and collective process. The main conclusion is therefore that Education for Sustainable Development should not be regarded simply as the teaching of sustainability-related content. Its deeper function is to develop the capacity to understand complex systems, anticipate change, reflect critically on values, cooperate with others and participate in meaningful action. In this sense, ESD can contribute to resilient societies by connecting individual learning with collective capacity. Its transformative role is realized when learners are not only able to explain what sustainability means, but are also equipped and empowered to participate in shaping more sustainable and resilient communities.

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