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Nuclear Power, Energy Crises, and Climate Change: The Imperative of Hazard Literacy Education

With the acceleration of climate change, the increasing frequency of wildfires and earthquakes, recurring energy crises, and the release of contaminated water from the Fukushima nuclear power plant, our societies are confronted with a growing range of natural and human-induced hazards. These circumstances highlight the critical need for educational approaches that foster hazard literacy—enabling individuals to think critically based on scientific information, act responsibly, and participate actively in addressing hazard-related challenges. This study presents a conceptual framework for hazard literacy education, developed through a comprehensive review of relevant literature and validated by nine experts in risk communication, disaster education, science education, geography education, and disaster management. The framework comprises five key dimensions. First, the Knowledge Dimension encompasses integrated content knowledge to understand the causes, progression, impacts, and responses to hazards from scientific, geographical, and socio-environmental perspectives, including both content and contextual knowledge. Second, the Reasoning and Skill Dimension refers to cognitive competencies such as higher-order thinking and inquiry skills essential for interpreting the complexity and uncertainty of hazards. This includes systems thinking, spatial reasoning, data-based reasoning, probabilistic thinking, and critical thinking. Third, the Values and Attitudes Dimension emphasizes civic and ethical orientations that value community safety, social equity, and ecological responsibility, including hazard sensitivity, ecological citizenship, and inclusive attitudes. Fourth, the Psychological and Emotional Dimension addresses individuals' internal capacity to manage emotional distress and psychological impacts of hazards through emotional regulation, self-efficacy, and resilience. And fifth, the Behavioral and Practical Engagement Dimension focuses on the ability to participate actively and responsibly in hazard prevention, response, and recovery, incorporating safety practices, hazard communication, and community-based actions. The proposed framework is expected to serve as a guiding foundation for the development of educational programs aimed at cultivating comprehensive hazard literacy.

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Consent

Yes

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