Contribution

A significant body of research on Education for Sustainable Development (ESD) has primarily focused on several key areas. These include the conceptualisation of ESD, its impact on the implementation of sustainability competences, especially the action competence among students, or the need for a pluralistic approach (see Boeve-de Pauw et al., 2015; Förster et al., 2019). Most of them concentrated on integrating ESD within higher education curricula (Bianchi, 2020). This research focuses on adapting ESD for the context of secondary education in metropolitan areas, which has been notably underexplored in academic research. Filling this gap by investigating the characteristics of holistic ESD tailored to urban settings is intriguing.

Therefore, the authors have explored the interconnected characteristics of ESD and urban education while finding common ground for secondary schools, in their previous conceptual review (Zenasni et al., 2024). These were merged into a conceptual framework, named ESDUC: Education for Sustainable Development in Urban Contexts. The ESDUC framework is designed to address the complex sustainability challenges facing secondary urban education. ESDUC consists of four essential building blocks with twelve interconnected characteristics (see numbers below) for ESD implementation into urban secondary school curricula, namely:

Competences: Equipping pupils with sustainability competences (1) helps developing sustainable attitudes and encourages ownership of a sustainable life through self-regulation skills (2). Teachers, too, must acquire ESD competences (3) to create a transformative learning environment. They should also possess intercultural competences (4) to embrace cultural diversity and integrate diverse perspectives on sustainability in their teaching.

Effective teaching strategies: for sustainability should foster a shift in values through a transformative (5) and culturally responsive learning approach (6) where teachers take into account cultural diversity. This approach should be tailored to the specific multicultural communities within urban schools, where the diverse global perspectives and experiences of pupils offer a unique opportunity for transformative learning. Transformative learning involves using materials and methods that encourage pupils to reflect on their values, and critically examine assumptions shaped by themselves and society, to ultimately develop their action competence for sustainability.

Community engagement:Increasing engagement with the community (7), pupils (8), and their parents (9), when addressing sustainability challenges, including place-based education (10), encompassing an affective connection to nature and other people.

School culture:Transforming school cultures toward a whole-school approach (11) involves embracing diversity (12) and integrating ESD transversally and intrinsically across various subjects, with the support of the entire school system.

This study extends the review by validating the framework through a Delphi approach, gathering expert consensus and expert validity on its content (relevance, and clarity), and addresses the following research questions:

To what extent do the experts validate the content of the ESDUC Framework?

Method

The Delphi method is a mixed-methods methodology designed to collect and organise expert opinions on a specific issue through a structured process that involves multiple rounds of anonymous questionnaires. Its main objective is to reconcile divergent viewpoints and reach a consensus among experts through feedback (Beiderbeck et al., 2021; Khodyakov et al., 2023). For this study, the authors

recruited international researchers or professionals specializing in ESD with an interest in urban contexts and/or culturally-responsive education, ideally those collaborating with secondary school environments or contributing to the development of educational materials. This expert group was selected through purposive sampling and convenience sampling, which resulted in 37 international experts. The selection criteria for the expert panel included: - Expertise in ESD - Knowledge and/or expertise in urban contexts and/or Culturally Responsive Education - Work experience with secondary schools and/or developing educational materials By applying these criteria, the researchers aimed to create a representative expert panel capable of providing comprehensive insights into the research topic. The panel was invited to respond to the Delphi questions via an online softwaretool (Qualtrics), with a response window of two weeks. In this study, the Delphi technique encompasses the following 3 rounds: Round 1: Exploring In the initial round of this Delphi study, an online questionnaire was developed using software tool Qualtrics to assess experts' perceptions of the ESDUC Framework. The questionnaire was organised around the framework's key building blocks and utilised a four-point Likert scale. A descriptive analysis will then be performed to examine the demographic characteristics and educational backgrounds in detail. For the Likert scale questions, the average score will be calculated. The Delphi technique will be applied to analyse the quantitative data, using an 70% consensus threshold to evaluate agreement on specific statements among the participants. Round 2: Iteration and implementation Responses from round 1 that did not achieve 70% agreement will be returned to the experts, along with the original questions, to allow them to provide further clarification or additional details about their answers. Those open-ended question responses will be qualitatively analysed using theme analysis. Round 3: consolidation In the third round, participants will receive a comprehensive summary of the findings in a clear and accessible format, including the consensus statements and conclusions drawn from the qualitative data.

Expected Outcomes

The anticipated outcomes of this Delphi study hold significant importance for the educational landscape, particularly in the areas of ESD and urban education, as it will result in a validates framework. Additionally, This research holds particular value for urban secondary schools aiming to integrate ESD into their educational framework effectively, offering insights into effective strategies and potential areas of improvement. The data for this study will be gathered between February 25 and April 25, and the analysis will be conducted using quantitative and qualitative methods. The findings from this analysis (incl. the methodology and data analysis) are scheduled to be unveiled at ECER 2025.

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