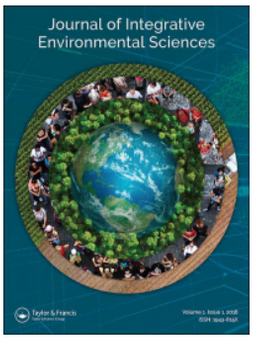


Journal of Integrative Environmental Sciences

ISSN: 1943-815X (Print) 1943-8168 (Online) Journal homepage: www.tandfonline.com/journals/nens20

Mapping education for sustainable development in super-diverse urban secondary schools in Brussels

Saphia Zenasni, Tom Emile Kuppens , Iris Stiers , Jill Surmont & Joost Vaesen

To cite this article: Saphia Zenasni, Tom Emile Kuppens , Iris Stiers , Jill Surmont & Joost Vaesen (2026) Mapping education for sustainable development in super-diverse urban secondary schools in Brussels, Journal of Integrative Environmental Sciences, 23:1, 2665516, DOI: 10.1080/1943815X.2026.2665516

To link to this article: https://doi.org/10.1080/1943815X.2026.2665516

JOURNAL OF INTEGRATIVE ENVIRONMENTAL SCIENCES
2026, VOL. 23, NO. 1, 2665516
https://doi.org/10.1080/1943815X.2026.2665516

Taylor & Francis
by informa

RESEARCH ARTICLE

OPEN ACCESS Check for updates

Mapping education for sustainable development in super-diverse urban secondary schools in Brussels

Saphia Zenasni[a], Tom Emile Kuppens[a,b,c], Iris Stiers[a], Jill Surmont[a] and Joost Vaesen[a]

[a]Vrije Universiteit Brussel, Multidisciplinair Instituut Lerarenopleiding (MILO)/Brussels Research Institute for Teacher Education (BRITE), Brussels, Belgium; [b]UHasselt – Hasselt University, School for Educational Studies (SES) – Research on Innovative and Society-engaged Education (U-RISE), Wetenschapspark, Diepenbeek, Belgium; [c]UHasselt – Hasselt University, Centre for Environmental Sciences (CMK) – research group Environmental Economics (EEC), Diepenbeek, Belgium

ABSTRACT

Education for Sustainable Development (ESD) is widely promoted through global frameworks, yet how these translate into practice in super-diverse urban secondary schools remains insufficiently understood. This study applies the ESDUC framework as an analytical lens to examine how its four building blocks: competences, teaching strategies, community engagement, and school culture are implemented in Dutch-speaking secondary schools in Brussels, and which factors influence their implementation. Drawing on a qualitative multiple-case study with interviews and focus groups involving pupils, teachers, and school leaders, the findings show that ESD implementation is partial and fragmented across schools and actor groups. Sustainability is predominantly framed in ecological terms, while transformative, culturally responsive, and community-based approaches remain weakly developed. Implementation is strongly shaped by urban realities such as multilingualism, socio-economic vulnerability, and a structural mismatch between pupils' lived experiences and school practices. By mapping these dynamics, the study identifies facilitating and constraining factors in applying ESDUC and offers context-sensitive insights for research, policy, and practice in Brussels and other metropolitan settings.

ARTICLE HISTORY
Received 30 June 2024
Accepted 22 April 2026

KEYWORDS
Community-engaged education; culturally responsive education; education for sustainability; transformative learning; urban education; whole-school approach

"… As long as I don't have a clear view of what those boys do on the street, I find it very difficult to make the connection with sustainability …" (TC4)

Introduction

Education for Sustainable Development (ESD)

ESD plays a key role in advancing sustainable development by fostering essential cross-cutting competences (i.e. knowledge, skills, attitudes, and values) needed to address diverse sustainability challenges and drive meaningful change across all levels, populations, and regions globally (European Commission. Joint Research Centre 2022; UNESCO 2018). ESD can be defined as holistic and interdisciplinary learning that fosters sustainability values, critical understanding of interconnected socio-economic and environmental systems, and individual and collective action towards a sustainable future (Mulvik et al. 2024). A range of terms is used to refer to the implementation of ESD, including environmental education (EE), learning for sustainability (LfS), environmental and sustainability education (ESE), climate change education (CCE), education for sustainability (EfS), and green education. While these concepts pursue similar aims, each emphasises distinct aspects of sustainability education. Throughout this study, the authors use the term "ESD", which extends beyond the ecological dimension of environmental education by also incorporating the social, cultural, and economic dimensions of sustainability into learning processes (Laine 2016; UNESCO 2022). While recognising nuanced differences between related terms, no explicit distinction is made.

CONTACT Saphia Zenasni saphia.zenasni@vub.be Multidisciplinair Instituut Lerarenopleiding (MILO)/Brussels Research Institute for Teacher Education (BRITE), Vrije Universiteit Brussel, Pleinlaan 2, Brussels, 1050, Belgium
Supplemental data for this article can be accessed online at https://doi.org/10.1080/1943815X.2026.2665516.

Article highlights

- Schools in super-diverse urban areas face several challenges in effectively implementing ESD, despite their commitment.
- Implementation of the ESDUC building blocks in super-diverse urban secondary schools is partial and fragmented; most elements are only weakly visible in practice.
- Sustainability is predominantly framed in ecological terms, with limited integration of social and cultural dimensions.
- Pupils call for more place-based and real-world learning, while teachers emphasise the need for tools for transformative and culturally responsive pedagogy.
- School leaders highlight the absence of a clear framework for cross-curricular collaboration and whole-school approaches.
- Mapping practice against the ESDUC framework reveals structural gaps: competences remain knowledge-focused, teaching strategies are largely traditional, community engagement is minimal, and whole-school approaches lack coherence with interculturality, which is often disconnected from sustainability practices.

Research coordinated by UNESCO (2018) has indicated that the development of sustainability competences alone does not automatically translate into sustainable action. Rather, it is the interplay between these competences, the underlying values, motivational factors, and opportunities, shaped by an individual's environment and context, that ultimately influences personal behaviour and action-oriented ESD. This underscores the need to move beyond traditional, transmissive teaching practices and to adopt participatory, learner-centred, and context-responsive approaches to teaching and learning (UNESCO 2018).

These insights have strongly shaped the direction of ESD research over the past decades. Accordingly, a significant body of research on ESD has primarily focused on several key areas. These include the conceptualisation of ESD, its impact on the implementation of sustainability competences, especially the pupils' action competence, or the need for pluralistic approaches to ESD (see Boeve-de Pauw et al. 2015; Förster et al. 2019; Jensen and Schnack 2006; Scott and Vare 2020; Sterling 2001; Vare and Scott 2007; Vare and Scott 2008; Wals and Benavot 2017). Many of these global frameworks have been situated within higher education (Bianchi 2020; Lambrechts et al. 2018), resulting in a translation gap for secondary schooling. This gap is particularly problematic given that sustainability challenges are equally pressing at the secondary education level. Secondary school pupils often equate sustainability primarily in environmental terms, with limited consideration of its other dimensions (Cifuentes-Faura et al. 2020). Despite international policy emphasising the importance of aligning ESD with local contexts (UNESCO 2018), ESD complexity requires pedagogies that enable multi-voiced engagement and collaboration across diverse actors (Lotz-Sisitka et al. 2015). However, empirical research in secondary schools has tended to focus primarily on environmental education (e.g. Dale et al. 2020). As a result, holistic forms of ESD that integrate environmental, social, economic, and cultural dimensions whilst responding to diverse learner contexts remain underexplored.

The urban context

Despite the proliferation of ESD frameworks, they rarely consider how implementation should be shaped by specific school contexts. This omission is significant: most young people worldwide are educated in urban areas (United Nations Human Settlements Programme (UN-Habitat) 2020), where sustainability challenges differ from both rural contexts and the assumptions built into global frameworks. Although global frameworks acknowledge the importance of context in general terms, they devote limited explicit attention to the social dimensions of sustainability and to the realities of super-diverse urban schooling. Urban superdiversity emerges from the interplay of societal, economic, demographic, and spatial dynamics, with a majority-minority population, i.e. the majority of residents belonging to minority communities with a migration background (Vandekerckhove et al. 2022). Accordingly, urban schools are cultural hubs shaped by dense populations and economic activity, attracting people from diverse ethnic, linguistic, cultural, and geographic backgrounds. Yet these areas also experience marked segregation, poverty, unemployment, and educational inequality, which arise from both external and internal school factors that influence opportunities, experiences, and learning environments, making it difficult to separate education from its broader sociocultural and sociopolitical contexts (Welsh and Swain 2020).

When context is considered, an important distinction emerges between rural and urban settings. Studies of rural settings highlight that sustainability issues are often experienced through close interaction with the

natural environment, where education is embedded in local ecosystems, and pupils engage in place-based learning that connects sustainability to their immediate surroundings and fosters a deep connection to nature (Giusti et al. 2025; Miles 2013). This is in contrast with urban settings, where ESD often intersects with issues of inequality and segregation (Welsh and Swain 2020) and is influenced by infrastructural constraints (Zulauf and Wagner 2021), such as pressures linked to, among others, mobility, housing, and poverty (Milner et al. 2015; Welsh and Swain 2020). Differences between urban and rural areas in relation to lifestyles, infrastructures, and forms of community building between urban and rural areas shape divergent needs and contextualisation of sustainability. Such contrasts are further reflected in divergences in values, motives, and drivers for sustainability among people living in urban versus rural settings (Zulauf and Wagner 2021). Recent research also reveals that resistance to sustainability discourses takes different forms across contexts, with rural youth framing it as threats to traditional livelihoods and urban youth perceiving it as distant from everyday life and economically burdensome (Urberg and Öhman 2024).

To ensure ESD remains relevant for pupils in urban secondary schools, global framings need to be adapted to super-diverse urban realities. The interplay of the above-mentioned societal, economic, demographic, and spatial dynamics makes urban schooling both a challenge and an opportunity for ESD. Although the high level of heterogeneity among pupils constitutes a challenge, this diversity also makes the multi-perspectival nature of sustainability issues tangible within the classroom. This article, therefore, focuses on urban secondary schools seeking to bridge the gap between the global framing of ESD and the everyday realities of pupils in urban super-diverse cities. Urban education is often viewed through a "deficit perspective", attributing inequalities to individual pupil deficits. Yet recognising the educational capital and cultural assets of these communities is vital for ESD (André and Westerveen 2024; Welsh and Swain 2020), as adolescents bring a wealth of perspectives, traditions, values, and behaviours on sustainability issues into the classroom (Alkaher and Tal 2016; Boeve-de Pauw and Van Petegem 2013). These conditions have direct implications for ESD as they highlight the need for pedagogies and school cultures that connect sustainability to urban realities (Yildiz 2021; Zenasni et al. 2024).

The role of the ESDUC framework

In response to identified gaps in the literature, Zenasni et al. (2024) developed the Education for Sustainable Development in Urban Contexts (ESDUC) framework. The framework addresses the dominance of higher education perspectives in ESD, the limited focus on school-level and contextual conditions, and the underrepresentation of socio-spatial realities in super-diverse urban secondary schools by offering a context-sensitive analytical lens grounded in urban secondary schooling. The framework was developed through a conceptual literature review that systematically analysed studies on ESD in urban secondary education, from the period 2014-2023. This ensured that the framework was not a purely theoretical construct but grounded in empirical research specifically focused on the secondary school context. The framework proposes four interconnected building blocks that together provide a comprehensive structure for integrating ESD into secondary education (see Table 1):

While promising, the framework has so far only been developed conceptually; its practical relevance and applicability in schools remain untested. As a first step, this paper will investigate the link between the framework and what actually happens at schools by using it as an analytical lens to examine how ESD is currently implemented in super-diverse urban secondary schools (i.e. in this study, super-diversity is operationalised primarily in terms of linguistic and socio-economic diversity). The authors do this with two goals in mind: first, to see how far the building blocks of the framework are already visible in classrooms and urban secondary schools; and second, to understand where extra guidance is needed to help super-diverse urban schools implement ESD more effectively.

Research questions

Based on this, the study is guided by the following research question:

RQ1: To what extent are the building blocks of the ESDUC framework currently implemented in the practices of super-diverse urban secondary schools?

RQ2: Which perceived factors constrain or facilitate the implementation of the building blocks?

Table 1. Overview of the building blocks and their characteristics of the ESDUC Framework.

Building block	Characteristic number	Characteristic description
1. Competences	(1) Pupils' sustainability competences:	Pupils should develop sustainability competences (skills, knowledge, values, and attitudes) that enable them to engage in meaningful action. (e.g. Bianchi 2020)
	(2) Pupils' self-regulating skills	Help pupils take increasing responsibility for their own learning for sustainability and for making sustainable choices in their daily lives. (e.g. Hampton 2016)
	(3) Teachers' ESD competences	Need for teachers to become competent in ESD, engaging in their own transformative learning so they can create conditions that foster transformative learning among pupils. (e.g. Förster et al. 2019)
	(4) Teachers' intercultural competence	Enabling teachers to integrate diverse cultural perspectives and support the pluralistic communication required in diverse learning environments. (e.g. Gay 2002)
2. Effective teaching strategies	(5) Transformative learning (TL)	Involves using methods that encourage pupils to reflect on their values and critically examine and explore assumptions shaped by themselves and society, to ultimately develop their action competence for sustainability. (e.g. Rodríguez Aboytes and Barth 2020)
	(6) Culturally responsive education (CRE)	Strategies that tailor sustainability learning to multicultural school communities, creating safe, inclusive environments that recognise socio-emotional needs, promote belonging, and ensure equal opportunity for minority pupils. (e.g. Rissanen 2022)
3. Community engagement	(7) Engagement with the broader community	Schools connect ESD to real-life societal issues by collaborating with local actors. (e.g. Alkaher and Tal 2016)
	(8) Engagement with pupils	Schools must actively involve pupils in sustainability initiatives to foster agency, participation, and a culture of achievement. (e.g. UNESCO 2018)
	(9) Engagement with parents	Engaging parents supports stronger school–home links, enhances ESD initiatives, and contributes to a culture of achievement and student empowerment (e.g. Lusse et al. 2019)
	(10) Place-based education:	Encompassing affective connections to nature, the local community, and other people. (e.g. Howari et al. 2019)
4. School culture	(11) Whole-school approach (WSA)	Integrating ESD transversally and intrinsically across various subjects, with the support of the entire school system. (e.g. Sterling 2001)
	(12) Intercultural school culture - recognition of diversity	School cultures that recognise and embrace diversity is essential for educational equity, especially in urban schools. (e.g. Yildiz 2021)

The research context

The metropolitan city-region of Brussels (Belgium) presents an intriguing case to address the formulated research questions. Brussels is the most super-diverse city in Europe, and as of 2022, three of four residents have a recent migration background, making it a majority-minority city (Vandekerckhove et al. 2022). Transformative learning for sustainability relies on the equal and meaningful participation of all members of the school community and on recognising the value of their strengths and lived experiences. Diverse urban contexts, such as Brussels, are characterised by super-diversity, bringing together pupils with a wide range of backgrounds, perspectives, and resources (Vertovec 2007). Such contexts can be understood as offering rich conditions for transformative learning opportunities. At the same time, studies on urban education highlight how population density, spatial segregation, and other urban characteristics impact the educational resources available to culturally diverse learners (Milner IV and Lomotey 2021; Young et al. 2024).

The ESDUC framework has the potential to account for these contextual dynamics and to identify the specific influencing factors they generate. Brussels' core area contrasts high rates of wealth and poverty, with almost one in three residents living below the poverty risk limit (Englert et al. 2023). This topical socio-demographic mixture poses educational challenges, including addressing pupil discrimination, social barriers, school capacity shortages (Sacco et al. 2016), and the need to tackle sensitive, polarising subjects (Surmont et al. 2023) such as sustainability challenges (i.e. lack of access to nature, heat-islands, poverty, unemployment, etc.) requiring multiple community stakeholder collaboration. Within the Flemish education system, including urban contexts such as Brussels, school teams report challenges in addressing socio-cultural diversity within their teaching practice (Van Droogenbroeck et al. 2025). Sensitive topics, whether related to ESD or not, are often regarded as taboo and consequently avoided (Maréchal et al. 2014). Additionally, the environmental sustainability dimension is high on the societal agenda, for example, in the form of demonstrations, sometimes violent, by pupils in Brussels (Wouters et al. 2022) or the politically contested pedestrianisation of Brussels' central boulevards (Te Boveldt et al. 2023).

Despite the above-mentioned call in the scientific literature on urban education to take into account different dimensions of inequalities as well as the diverse backgrounds and experiences of pupils, policy

discourse in Belgian education tends to address axes of inequality individually, with limited attention to their interconnections (André and Westerveen 2024). One-sided perspectives are inherent in the organisation and functioning of education in Brussels. In this context, Brussels features a triple educational system, with (alongside international and private schools) publicly funded schools divided into French-speaking and Dutch-speaking systems (Janssens and Vaesen 2015). The educational institution chooses to be part of the French-speaking or Dutch-speaking educational system. Brussels residents nowadays have the right to decide for themselves their educational institution and thus the language of instruction for each of their children. In addition to its two official languages, Brussels boasts a broad linguistic and cultural base, with currently more than a hundred different registered languages (Saeys 2024), contributing to a rich linguistic environment within its schools. However, Dutch-speaking schools often maintain monolinguistic practices, disadvantaging pupils whose home language(s) differ from Dutch (Pulinx et al. 2014; Van den Branden and Verhelst 2011).

The authors focused on Dutch-speaking publicly funded and publicly run schools of the Flemish Community (GO! Onderwijs van de Vlaamse Gemeenschap) in Brussels, all sharing a common pedagogical framework. Unlike French-speaking schools in Brussels, Dutch-speaking schools keep track of socio-economic and ethno-cultural (albeit limited to language) indicators of the pupil population (Jacobs et al. 2025), which enabled the authors to conduct purposive sampling. As a starting point in the five case studies, linguistic and socio-economic indicators were used as pragmatic proxies for pupil diversity, reflecting the monitoring practices of the Flemish education system, which primarily reports on home language (Dutch vs. non-Dutch) and socio-economic status. Nonetheless, the findings of this study remain relevant for French-speaking schools in Brussels. Indeed, recent research on language use in the city documents 104 languages spoken by its residents, with many children raised in linguistically mixed households, highlighting Brussels' pronounced multilingual character (Saeys 2024).

ESD within the multifaceted layers of diversity in urban contexts demands targeted attention, particularly in secondary education. Examining the current practices of ESD in Brussels can provide valuable insights to support urban schools in enhancing their implementation of ESD.

Research methodology

This study adopts a qualitative multiple case study design to examine how ESD is implemented in Dutch-speaking secondary schools in Brussels. The ESDUC framework was applied as the conceptual and analytical lens, in line with Miles et al. (2014), who emphasise that conceptual frameworks offer a structure that can inform both data collection and analysis. It served two functions: (i) guiding the development of interview protocols and (ii) structuring the analysis of findings. In this way, the framework ensured that both existing practices and perceived factors could be systematically explored. To strengthen the breadth and credibility of the study, the authors employed a triangulation strategy as recommended by Flick (2018). Multiple perspectives and methods were integrated by combining in-depth interviews with school leaders and focus group discussions with pupils and teachers.

The interview protocols (see Appendix A) were explicitly structured around the four building blocks of the ESDUC framework. Each protocol was tailored to the specific role of the participant group. The teacher protocol focused on, among others, classroom practices, teaching strategies, and their own competences, while the school leader protocol addressed school-wide policies, organisational conditions, and strategic decision-making. Pupils contributed towards experiential and affective perspectives on how ESD is implemented in classrooms and across the school. Although adapted to each group's role, all protocols were grounded in the same twelve ESDUC characteristics.

The deductive codes were derived from the building blocks of the ESDUC framework, while their specific operationalisation emerged through inductive coding of the responses. An inductive factor was coded as present when participants described practices, routines, or structures (such as examples of learning activities, descriptions of competence development, evidence of intercultural or transformative practices, references to partnerships or school culture) that aligned with its underlying deductive coded characteristic. Constraints were coded when participants pointed to factors that hindered or limited these practices (for example, lack of time, resources, expertise, or organisational support), while facilitators referred to enabling factors (such as supportive leadership, teacher collaboration, or existing partnerships). This design enabled

the authors to address both research questions by systematically identifying the extent to which these building blocks were present in practice (RQ1) and capturing areas where additional guidance was needed (RQ2).

Desk research identified five suitable schools out of the fifteen. Public information on the schools' websites was screened for any references related to the twelve ESDUC characteristics (for example, mentions of partnerships, school projects, pedagogical visions, or sustainability initiatives). This initial screening was used only to create a broad classification of schools with low (<3 characteristics), moderate (4-5 characteristics), or higher (>6 characteristics) visibility of sustainability-related activities, allowing the authors to select a diverse sample (see Table 2). Diversity in educational levels was also sought, including schools offering different study tracks, namely higher education-oriented programmes (preparing pupils for further study), dual-oriented programmes (combining preparation for further education and direct entry into the labour market), and job market-oriented programmes (vocational education pupils who are prepared for the job market). Furthermore, schools with comparable pupil demographics were specifically targeted, employing the "Indicators of Deprivation" measurement tool. This tool provides insights into a pupil's social profile (i.e. home language, socio-economic status) by assigning a score based on the number of risk characteristics they exhibit. In Brussels, almost every pupil shows at least one ID characteristic, and scores on all indicators have risen over the past five years. The average score across the fifteen schools is 2.36 (Dataloep 2022).

Five diverse urban schools were selected, with the rationale for their inclusion outlined below to provide a solid basis for examining ESD implementation via the ESDUC framework.

School A. This expansive green campus offers a wide range of specialised labour market programmes across multiple locations in Brussels. This school was selected for its emphasis on community-engaged education on its website, a key component of ESDUC.

School B. A medium-sized school, situated on a bustling urban street, which offers both general and artistic education programmes. The school website lists three ESDUC characteristics focusing on pupil self-regulating skills, pupil engagement, and a school culture embracing diversity.

School C. A small school that offers various labour market programmes. Their website highlights five ESDUC characteristics, demonstrating initiatives such as developing pupil self-regulation skills, providing an intercultural school culture, and involving the community and parents in school policies.

School D. A medium-sized school offering all three programmes. Their website highlights only two ESDUC characteristics: pupils' sustainability competences and self-regulating skills.

School E. The largest school in our sample is an Eco-school (certified for its commitment to ESD), offering various classes and study paths exclusively for higher education programmes. Their website highlights six ESDUC characteristics, showcasing their commitment. They prioritise pupil sustainability competences, involving pupils and parents in sustainability initiatives, and emphasising a holistic approach considering diversity. It is noteworthy that pupils attending this school are generally from higher socio-economic backgrounds.

To align the study's objectives with the pupils' educational programmes, school leaders and teachers from each selected school nominated a class for participation in this study. Class groups were chosen based on factors such as class size, grade level (14-16 years), educational programmes, and pupil availability. Only those pupils having parental consent and were willing to participate were involved. In a subsequent stage, teachers from the same schools, who taught the corresponding classes, were also invited to join.

Data collection

Data was collated over five months (October 2023 - February 2024) across five schools. The sample included five school leaders, seventeen teachers, and thirty pupils, selected to gather insights (such as practices,

Table 2. Overview of selection criteria of school characteristics.

Selection Criteria	School A	School B	School C	School D	School E
Desk research: ESDUC implementation	Low	Low	Moderate	Low	High
Indicators of Deprivation-score	2,25	2.21	2,16	2.67	1.94
School size	280	343	81	322	978
Study-track	Job market	Dual	Job market	Higher education	Higher education

visions, constraints, etc.) from those directly involved in sustainability-related practices to address both RQ1 and RQ2. Collecting school leaders' perspectives on ESDUC implementation was an essential step in the data collection process. This was achieved through semi-structured, in-depth interviews. Pupils' perspectives were gathered through five focus group interviews to ensure diverse views. The interviews and focus groups were audio-recorded and subsequently transcribed. The semi-structured sessions started with reflective exercises (in the form of statements and guiding questions) and photo-sequencing tasks to allow pupils to consider their personal views on sustainable development (see picture 1, Appendix B). This was followed by an open dialogue, centred on ESDUC implementation and concluded with a discussion on their ideal perception of ESD within their school. These elements allowed the authors to examine not only the current state of implementation (RQ1) but also pupils' perceived influencing factors (RQ2). The perspectives of teachers were also measured through the focus group method. Data collection took place primarily through in-person interactions, although some online video calls were conducted when necessary.

As shown in Table 3, the sample reflects the diversity of schools and pupil populations in terms of educational track, origins, and multilingualism. This variation is contextual and analytically relevant for examining how practices and perspectives are implemented across diverse urban school contexts. Two classes are oriented towards higher education, one adopts a dual-orientation pathway, and two are directed towards the labour market. The participant-recruitment approach resulted in a heterogeneous pupil group, with 80% residing in Brussels and 66.7% holding non-EU origins. The pupil group mirrors the linguistic diversity of Brussels households, with about 50% of the pupil sample speaking foreign languages at home, while only 23% of them speak Dutch exclusively. Despite this, the sample group is proficient in at least two languages, with some mastering up to four. It is noteworthy that School E predominantly comprises pupils of Belgian origin, and School B's pupil sample displayed the highest diversity with regard to the selected indicators.

In contrast, the teacher sample showed less linguistic and cultural diversity, with thirteen out of the seventeen sampled teachers being native Dutch speakers (see Table 4). The majority of these teachers are male, with only three holding origins other than Belgian, and half residing outside Brussels. Moreover, over half have less than two years of teaching experience, while only three possess more than 20 years of experience. This teacher profile is important when interpreting findings related to both RQ1 and RQ2, as teachers play a key role in implementing ESDUC practices while also navigating school-level constraints.

In our sample, there were five school leaders, including one educational ICT coordinator, one policy support officer, and three school principals. Interestingly, unlike the pupil sample, all these school leaders are native Dutch speakers, with most not living in Brussels (see Table 4). Their insights were essential for examining strategic and organisational factors that influence ESDUC implementation (RQ2).

Table 3. Overview of pupil characteristics, providing insights into the diversity of the pupil population.

	Number & Gender	Residence	Number of languages mastered per pupil	Only Dutch as family language	Not only Dutch as a family language	foreign-family languages	Origin	Age	Educational programme
School A	3 ♂ 0 ♀	Brussels (1) Flanders (2)	2	2	0	1	Belgian: 2 EU: 0 Non-EU: 1	14-18	Labour market (plant-animal, and environment
School B	2 ♂ 3 ♀	Brussels (5)	3	0	3	2	Belgian: 0 EU: 0 Non-EU: 5	14-16	Dual (photography and audiovisual arts)
School C	6 ♂ 0 ♀	Brussels (3) Flanders (2) other (1)	3-4	0	1	5	Belgian: 0 EU: 1 Non-EU: 5	16	Labour market (electricity-wood)
School D	3 ♂ 6 ♀	Brussels (9)	2-3	0	2	7	Belgian: 0 EU: 1 Non-EU: 8	15	Higher education (economics-mathematics)
School E	3 ♂ 4 ♀	Brussels (7)	2-3	5	2	0	Belgian: 4 EU: 2 Non-EU: 1	13-14	Higher education (classical language)

Note: ♂ = male; ♀ = female.

Table 4. Overview of teacher and school leader characteristics, providing insights into the diversity of the teacher and school leader population.

	Number & gender	Age	Residence	Years of experience	Mother tongue	Origin	Function
School A Teachers	3 ♂	29-42	Brussels (1), Flanders (2)	2-5:1 5-10:1 20-30:1	Dutch (2), other (1)	Belgian (2), other (1)	Job market-oriented teacher
School A School leader	1 ♀	43	Flanders	3	Dutch	Belgian	Educational ICT Coordinator
School B Teachers	1 ♀ 1 ⚧	27-40	Brussels (2)	0-2:2	Dutch (2)	Belgian (1), other (1)	Dual orientated teacher
School B School leader	1 ♀	44	Flanders	2	Dutch	Belgian	Policy Support Officer
School C Teachers	4 ♂ 1 ♀	26-58	Brussels (2), Flanders (3)	0-2: 2 10-20:2 20-30:1	Dutch (4), Fr (1)	Belgian (4), other (1)	Job market orientated teacher
School C School leader	1 ♂	58	Flanders	28	Dutch	Belgian	Principal
School D Teachers	5 ♂	29-60	Brussels (3.5), Flanders (1.5)	0-2: 3 5-10:2	Dutch (3), other (2)	Belgian (3), other (2)	Higher education-oriented teacher
School D School Teacher	1 ♂	37	Flanders	3	Dutch	Belgian	Principal
School E Teachers	2 ♀	26-54	Flanders (2)	0-2:1 20-30:1	Dutch (2)	Belgian (2)	Higher education orientated teacher
School E School leader	1 ♂	42	Brussels	12	Dutch	Belgian	Principal

Note: ♂ = *male;* ♀ = *female.*

The twelve ESDUC characteristics guided all question protocols, operationalising the four building blocks across all participant groups. This ensured that the conceptual framework directly guided data collection. Interviews with school leaders and focus groups with pupils and teachers were piloted beforehand.

All data was recorded in logbooks. Ethical approval for the interviews and focus groups involving teachers, pupils, and school leaders was obtained from the Human Rights Ethics Committee of the Vrije Universiteit Brussel (Reference Number: ECHW_438). All respondents, including the parents of minors, signed informed consent forms, which explained the research and their rights. Additionally, the data was anonymised to ensure privacy and confidentiality. These measures were maintained throughout the research process to adhere to ethical standards and protect the participants' identities and personal information.

Data analysis

Reflexive thematic analysis (Braun and Clarke 2021) was employed to analyse the interviews of the three subgroups within each school. A deductive coding scheme, grounded in the conceptual ESDUC framework, guided the analysis of the dataset, allowing for the systematic identification of patterns using Nvivo software. The interview protocols for teachers, pupils, and school leaders were all based on the same characteristics of the ESDUC framework. This allowed triangulation as all three groups were asked about the same themes. During the methodological process, the authors critically reflected on the alignment between interview questions, participant responses, and the ESDUC characteristics. While the protocols were structured around the framework, the actual coding was guided by the substantive content of the data. As a result, some responses were coded under a different building block than initially anticipated, ensuring an analytically sound and content-driven application of the framework. During analysis, the deductive codes showed what was already implemented (RQ1), while the inductive codes revealed influencing factors (RQ2). The coding tree was systematically applied three times per school, once for each actor group.

After a comprehensive dataset review, the deductive coding scheme was enriched with inductive codes, forming the basis for original first-level codes and subcodes. This dual coding strategy ensured that the analysis systematically mapped the extent to which ESDUC-building blocks were present in practice (RQ1) while also revealing contextual facilitators and constraints highlighted by participants (RQ2). An intercoder reliability assessment ensured code quality. The primary researcher initially coded most of the data, while the second researcher coded a 10% representative subsample. The coding framework was refined until high agreement between coders was achieved. Subsequently, the primary researcher continued coding the remaining data independently. Five within-case analyses (one per school) were conducted for each of the

12 ESDUC characteristics and for each actor in the triangulation, resulting in 180 schematic outlines (see one example, Figure C1 - Appendix C).

Subsequently, these outlines were compared across cases for each characteristic and actor of the triangulation to identify similarities and differences (see Figure C2—Appendix C).

This study presents findings from these across-case analyses, with within-case analyses available for reference. Respondents were anonymised using a two-letter and number code. The first letter represents the respondent's role (Pupil, Teacher, School leader), the second letter indicates the school (A, B, C, D, E), and the number identifies the specific individual (1, 2, 3, etc.). Illustrative quotes of the building blocks are attached in Appendix D.

Results

The results are organised according to the four building blocks of the ESDUC framework. For each building block, both research questions are addressed. First, the section presents the current implementation of the building block in urban secondary schools (RQ1), including both school-specific findings (as summarised in the tables) and cross-case patterns. Next, the influencing factors that facilitate or constrain this implementation are discussed (RQ2), again combining individual school findings with overarching insights. This structure is applied consistently across all four building blocks.

ESDUC building block 1: competences

Table 5a presents a comparison across schools for building block 1 "competences" (RQ1). To better understand these patterns, Table 5b presents the main constraints and facilitators (RQ2) influencing the implementation of pupils' sustainability competences across the five schools.

(1) Pupils' sustainability competences

Current implementation

As shown in Table 5a, across the five schools, the implementation of pupils' sustainability competences is limited and inconsistent. Understanding of sustainability is consistently confined to everyday practices (e.g. saving water, energy, recycling), with mainly financial motivational drivers, indicating a narrow, practice-based interpretation of sustainability. The primary sources of learning are home, parents, and earlier schooling; secondary schools mainly reinforce existing awareness rather than developing new competences. Awareness is strongly context-dependent, shaped by pupils' lived experiences, socio-economic transitions, family backgrounds, and educational trajectories, which constrain its anchoring and transfer across contexts. Only School E shows broader competence development, including self-reflection and systems thinking, supported by school-wide initiatives. In the other schools, sustainability competences remain awareness-oriented, fragmented, and weakly embedded at the school level.

Influencing factors

Across the five schools, Table 5b indicates that implementation is facilitated when sustainability practices are already embedded in pupils' homes or local contexts. Media exposure, family discourse, and informal circular practices further support basic awareness. Implementation is constrained by socio-economic vulnerability, which shifts priorities away from sustainability, and by the strong context-dependence of awareness, making it difficult to anchor and transfer learning across pupils' lived experiences, thus resulting in fragmented uptake across contexts. Limited explicit school engagement and perceived demographic mismatch between teachers and pupils further constrain implementation. Across schools, secondary education plays a weak role in competence development, resulting in sustainability being perceived as incidental rather than an explicit, school-owned competences.

(2) Pupils' self-regulating skills

Current implementation

Across the five schools, pupils' self-regulating skills related to sustainability are partially implemented and unevenly developed. As indicated in Table 5a, Pupils generally express basic confidence in

Table 5a. Cross-case comparison of the implementation of ESD from the insights of pupils, teachers, and school leaders of building block 1: competences.

Building Block 1: Competences

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
(1) Pupils' sustainability competences	**Pupils**	**Ecological sustainability understanding**	Everyday sustainability practices (saving water, energy)	Everyday sustainability practices (saving water, food waste)	Everyday sustainability practices (recycling, littering)	Everyday sustainability practices (recycling, reuse, waste)	Everyday sustainability practices (water, heating, recycling)
		Primary source of learning	Home/parents	Home/primary school	Home/previous schools	Home/primary school	Home/media/primary school
		Role of secondary school	Reinforcement of awareness only	None	Weak	Reinforcement of awareness only	Reinforcement of awareness only
		Nature of motivation	Financial (household cost savings)	Financial (cost-saving)/ environmental	Financial (savings)/ethical (fair trade, labour)/environmental	Financial/economical (household cost savings)	Moral concern/Financial (household cost savings)
	Teachers	**Awareness emphasis**	Awareness-oriented: handling materials	Awareness-oriented	Awareness-oriented: Norms and values	Implicit sustainability through daily practices	Awareness-oriented
		Type of competences	Practical skills and routines (material (re)use)	Basic awareness	Behavioural norms: respect	Informal	Reflective awareness
		Context-dependent awareness (subject, population)	Embedded in vocational/ practical lessons	Hindered by individualistic values and unsustainable aspirations when transitioning out of poverty	Difficult to anchor due to pupils' street-oriented lifeworld	Pupils are not aware of circular economic aspects in their daily habits (sharing clothes, avoiding air travel)	Influenced by family background/previous schooling/uneven uptake
	School leaders	**Awareness emphasis**	Strong	Strong	Strong	Strong	Strong
		Type of competences	Initiative taking	Sustainable consumption and actions	Use of energy and materials/ interpersonal competences	Responsibility/ coexistence/choice-making	Self-reflection and systems thinking
		School-level integration	Gradual across grades	Absent	Partial via routines	Embedded in norms	School-wide initiatives
(2) Pupils' self-regulating skills	**Pupils**	**Self-confidence to act sustainably**	Awareness of imperfect behaviour	Uncertainty about doing things correctly	Confidence is framed as having "enough talent"	Individual willingness rather than skill	Sustainability is seen as a simple behaviour
		Limited teacher support	Motivational words encourage confidence	Little perceived guidance	Provide reminders (e.g. reusable bottles)	Have little influence	Provide reminders (e.g. emails about littering)
	Teachers	**Pedagogical strategy used**	Repetition until behaviour "clicks"	Not explicitly addressed	Constant reminders/correction	Discussion	School-wide initiatives
		View on pupils' self-regulation	Seen as a slow, gradual process	Not actively developed	Pupils forget without prompting	Reflection encouraged, but fragile	Reflections through initiatives
		Role of home context	Prerequisite	Implicitly decisive	Implicitly decisive	Implicitly decisive	Dominant over school influence
	School leaders	**Continuous attention (process-oriented)**	Ongoing/difficult to evaluate	Necessary but still exploratory	Complex and difficult to realise consistently	Integrated via leadership development initiatives	Integrated via continuous dialogue
		Responsibilities of pupils	Implicit via projects, not systematically structured	Explicit focus on pupils taking responsibility for waste behaviour	Dependent on teacher attitudes and pupil context	Addressed indirectly through shared leadership vision	Explicitly framed as pupils recognising their own role and responsibility

Table 5a. (*Continued*)

Building Block 1: Competences

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
		Role of school culture	Limited articulation	Policy-oriented (waste policy) but early stage	Fragmented due to socio-economic and pedagogical diversity	Strengthened through mission development (shared leadership approach)	Vision-driven approach grounded in dialogue and school-wide models
(3) Teachers' competence in ESD	**Pupils**	**Teacher passion and enthusiasm**	Clearly present	Present (maths/science teacher)	Specific staff	Several teachers	Present (history/science teacher)
		Inspirational teaching style	Having animals/becoming less stressed in nature	Active, musical, calming teaching style	Very limited	Strong (interactive, humour, give examples)	Strong (storytelling, discussion, reflection)
		Implicit integration of sustainability themes	Present mainly in ethics/ some courses	Occasional, informal references	Not systematic	Present through concrete actions (food distribution)	Through reflections and actions (being part of an ecological working group)
		Perceived impact on pupils' reflections	Limited (forget)/do not receive explanation on the why of actions	Limited (forget)	No behavioural change attributed to the school	Inspiration acknowledged/limited behaviour change	Some learning/limited behavioural impact
	Teachers	**Repetition and gradual sensitisation**	Behavioural change through repeated actions and explanations	Behavioural change through repeated projects, but requires broader framing	Repetition needed, but effects fade quickly and require constant restarting	Small reminders and repetition are necessary but insufficient	Strong belief in repeated exposure via whole-day events and recurring signals
		Context-sensitive pedagogy & own beliefs	Limited evidence of explicit transformative framing	Need to move beyond "good-bad" thinking/align ESD with pupils' lifestyles/ build teacher capacity	Teachers struggle with pupils' demotivation	Discussion sometimes triggers reflection, but rarely sustained transformation	Emphasis on experiential learning/avoiding prohibitive measures
		Subject-dependent implementation	Impact depends on repetition rather than subject integration	ESD mainly appears in specific projects or motivated individuals	Strong dependence on teacher beliefs/class dynamics/pupil motivation	Explicit ESD is mainly present in certain subjects and absent in others	ESD fits some subjects and activities better than others
	School leaders	**Teacher initiative in sustainability projects**	Individual teachers initiate/ ecoteam projects	Teacher engagement depends on individual initiative	Individual teachers take initiative	Teachers combine sustainability with other initiatives when workload allows	Sustainability initiatives linked to ecoteam projects
		Teacher autonomy to develop ESD practices	Limited space to start own projects due to curriculum planning	Small-scale ecological initiatives are possible	Initiatives remain dependent on motivated individuals	High workload limits sustained teacher engagement	Projects embedded in existing structures rather than individual autonomy
		Teachers as role models and discussion facilitators	Teachers are expected to give examples and initiate discussion	Teachers model sustainability through concrete actions	Teachers model sustainable behaviour unevenly across staff	Teacher engagement fluctuates with contextual pressure	Teachers involved in applied projects with pupils
(4) Teachers' intercultural competence	**Pupils**	**Linguistic accessibility and understanding**	Teachers translate or explain	One teacher translates into the pupils' home language	Limited reference to translation or explanation	Teachers rephrase and explain when needed	Depends on the individual teacher
		Perceived relational safety	Pupils feel safe depending on the teacher's mood	Strong sense of safety with one specific teacher	No explicit feeling of safety reported	Pupils feel safe with trusted teachers	Safety varies strongly by teacher

(*Continued*)

Table 5a. (*Continued*)

Building Block 1: Competences

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
		Recognition of cultural background	Cultural background taken into account informally	Explicit acknowledgement of pupils' backgrounds by some	Some do recognise/others are racist/others are obliged due to the pupil population	Background recognised through care figures	Inconsistent recognition across teachers
	Teachers	**Managing neutrality and cultural diversity**	Neutrality charter guides classroom practice, but teachers take into account some cultural practices on a school level (e.g. clothing, Ramadan)	Tension between the neutrality charter and diversity inclusion (headscarves), keeping the gates closed	Neutrality guides classroom practice, but teachers take into account some cultural practices on a school level (e.g. clothing, Ramadan)	Living together is seen as the most important, not the differences	Learning to get along together (boys and girls playing sports together), neutrality charter guides classroom practice, but keep in mind during excursions (clothing, praying)
		Integration of pupils' everyday life	Societal issues used as discussion triggers	Deliberate effort to broaden dominant narratives/ difficult as pupils have other concepts of sustainability	Street culture hinders ESD/ cultural insiders add value/ neutrality on societal issues is hard to maintain.	Neutral stance in sensitive discussions.	Confronting the integration of societal issues to keep neutrality
		Teacher positionality and competence	Awareness without explicit self-positioning	Strong reflective stance on own role	Lack of intercultural and religious competence necessitates support from a religious colleague.	Background informs interaction with pupils	Lack of intercultural and religious competence necessitates support from a religious colleague.
	School leaders	**School climate for diversity**	Emphasis on open school climate	Explicitly inclusive school identity (listening to each other)	Diversity is framed as an ongoing challenge/respectful school climate/diversity in teaching staff	Open dialogue encouraged; discussion space exists even for sensitive topics, but thresholds	Open dialogue is clearly present
		Structural accommodations	Efforts to respect cultural diversity (inclusive textbooks)	Limited formal accommodations mentioned	Ad hoc accommodations via teachers	Whole-school approach (inclusive textbooks)	Pupils can come over to the principal
		Dependency on individual teachers (discussing societal themes and diversity)	Strongly teacher-dependent	Strong teacher dependency (linguistic diversity, safe classroom climate)	us-them' divide	Less reliance on individuals/supported more broadly	Teacher dependency explicitly noted

Table 5b. Influencing factors that facilitate or constrain the implementation of building block 1: competences.

Building Block 1: Competences

Characteristics	Influencing factors	School A	School B	School C	School D	School E
(1) Pupils' sustainability competences	**Facilitators**	Daily sustainability practices are reinforced at home and occasionally at school	Basic awareness supported by earlier schooling and home practices	Economic and ethical practices embedded in everyday life (e.g. saving, fair trade)	Informal circular practices in the local context support sustainable behaviour	Media, family, and moral discourses stimulate basic sustainability awareness
	Constraints	Sustainability remains limited to small actions/little school-driven behaviour change	Socio-economic vulnerability makes sustainability a lower priority in daily life/weak continuity in secondary school/ perceived demographic mismatch between teachers and pupils	Learning is difficult to anchor due to pupils' street-oriented lifeworld/ limiting school ownership of sustainability competences	Pupils are not aware of their sustainable lifestyles due to the poverty context/limited explicit school engagement	School contribution perceived as minimal; sustainability not developed as an explicit competence
(2) Pupils' self-regulating skills	**Facilitators**	Teacher encouragement builds confidence; repetition supports gradual behaviour change	School-level intention to reinforce waste policy and peer responsibility	Repeated prompting and actions across moments/initial steps toward self-regulation	Dialogue-based repetition supported	Open dialogue culture fostering reflection and awareness of personal role
	Constraints	Behaviour change remains partial/ strongly dependent on home values	Pupils feel uncertain/ limited teacher engagement with self-regulating skills	High teacher-dependence/home responsibilities/ disengagement limit continuity	Sustainable behaviour is often compliance-driven rather than self-initiated	Self-regulating skills are not explicitly structured
(3) Teachers' competences in ESD	**Facilitators**	Teacher passion and subject knowledge support credibility/ reflective explanations	Individual teachers initiate broader, transformative approaches (outdoor learning, upcycling, mobility projects)	Individual teachers attempt initiatives	Explicit curriculum anchoring in some subjects/ discussion triggers reflection in certain groups	Whole-day events and repeated exposure create experiential impact/visual presence
	Constraints	Behavioural change remains fragile/ explanations are not always retained or comprehensive by pupils/curriculum constraints	Teacher competence highly dependent on individual engagement/ limited school-wide embedding/ absence of tools according to pupils' demographics and lifestyles	High administrative pressure limits sustained ESD practice/initiatives remain short-lived/ pupil demotivation/time pressure	Strong variation by finality and group/everyday reminders are not always understood or internalised	Teacher competence varies strongly by subject/ESD often stays implicit or outside regular lessons
(4) Teachers' intercultural competences	**Facilitators**	Teachers adapt language and learning materials/ openness to discussing societal concerns	Active inclusion of diverse cultural references in lessons	Presence of culturally embedded teachers (e.g. Islam teacher) enabling connection with pupils' backgrounds	Safe space for expressing different opinions when trusted staff involved/whole-school approach	Open space for dialogue and discussion of sensitive topics/staff open to intercultural knowledge
	Constraints	Highly teacher-dependent/ institutional neutrality limit perspective inclusion	Lack of a shared school-wide approach/strong teacher dependency/ institutional neutrality limit perspective inclusion	Lack of competence and cultural knowledge/"us-them" divide/no vision on pupils' 'lives/institutional neutrality limit perspective inclusion	Barriers to explicitly addressing multiple perspectives (psychological, informational, age-related)/ institutional neutrality limit perspective inclusion	lack of competence/ institutional neutrality limit perspective inclusion

performing simple sustainable actions, but this confidence is rarely supported by explicit instruction, teacher support, or structured competence development at the school level. Implementation mainly takes the form of repetition and home-influenced rather than deliberate scaffolding of self-regulation. Only in Schools D and E is self-regulation more explicitly supported through dialogue, reflection, or school-wide initiatives, while in the other schools, it remains implicit and teacher-dependent.

Influencing factors

Implementation is facilitated when teachers consistently repeat expectations, engage pupils in dialogue, or when school leadership embeds reflection within school culture (notably Schools D and E). In contrast, implementation is constrained by strong dependence on home values and teachers. In several schools, without prompting, sustainable behaviour remains compliance-driven, fragile, and difficult to sustain. Derived from Table 5b, the lack of systematic, school-wide articulation of self-regulating skills across the schools limits pupils' ownership of sustainable action.

(3) Teachers' competences in ESD

Current implementation

Across the five schools, teachers' ESD competence is partially implemented and remains largely awareness-oriented rather than transformative. From the pupils' perspective, as presented in Table 5a, ESD is mainly associated with individual teachers' passion, enthusiasm, and inspirational teaching styles. Sustainability themes are implicitly integrated, often limited to specific subjects or concrete actions, and rarely lead to sustained behavioural change. Teachers themselves describe their ESD competence as relying primarily on repetition, sensitisation, and explanation without coercion, with limited confidence in their capacity to foster durable behavioural change. Implementation is strongly subject-dependent, appearing more readily in certain disciplines or projects than as a cross-curricular practice. Within school leadership, ESD competence is not institutionally consolidated. Sustainability initiatives depend mainly on individual teacher initiative and engagement or ecoteam projects, with limited articulation of teachers' ESD competence as a school-wide professional capacity.

Influencing factors

As evidenced in Table 5b, implementation of Teachers' competences in ESD is facilitated when teachers demonstrate strong subject knowledge and personal engagement, and when ESD is supported through experiential approaches such as projects, outdoor learning, whole-day events, or visible presence. Explicit curricular anchoring in specific subjects and recurring exposure further strengthen implementation (school D). Implementation is constrained by a high dependence on individual teachers, workload, lack of embedding at the school level, curriculum, and administrative pressures, or the absence of tools related to pupils' demographics and lifestyles.

(4) Teachers' intercultural competence

Current implementation

Teachers' intercultural competence is unevenly implemented across the five schools and remains largely teacher-dependent rather than structurally embedded. From the pupils' perspectives, as demonstrated in Table 5a, intercultural responsiveness is mainly experienced through individual teachers' linguistic accessibility, relational safety, and informal recognition of cultural backgrounds. Very few teachers at each school are consistently recognised as culturally responsive or approachable. Teachers themselves report difficulties in balancing neutrality with diversity, particularly when addressing sensitive societal issues. Intercultural competence is primarily implemented through rephrasing, (pedagogical) adjustments, and cautious discussion, whereas explicit integration of pupils' lived experiences into ESD remains challenging. At school leader level, intercultural competence is framed as part of an open and respectful school climate.

Influencing factors

As demonstrated in Table 5b, implementation is facilitated when teachers adapt language and materials, create safe spaces for dialogue, and draw on culturally embedded staff (e.g. religion teachers) to connect with pupils' backgrounds. Open school environments, inclusive learning materials, and whole-school dialogue practices further support intercultural engagement. Implementation is constrained by strong dependency on individual teachers, limited intercultural and religious competence among teachers, and tensions arising from neutrality regulations, which restrict explicit engagement with multiple perspectives. Across schools, the absence of a shared school-wide vision and the perceived difficulty of addressing pupils' everyday realities contribute to fragmented and cautious implementation of intercultural competence within ESD.

ESDUC building block 2: effective teaching strategies

Table 6a presents a comparison across schools for building block 2 "effectice teaching strategies" (RQ1), and Table 6b shows the main constraints and facilitators (RQ2) for this building block.

(5) Transformative learning

Current implementation

Across the five schools, the transformative learning approach is only partially implemented. Elements such as discussion of real-life issues, experiential activities, and occasional pupil reflection are present, but they are implicit and strongly teacher-dependent. Table 6a highlights that transformative learning is rarely recognised as a shared pedagogical approach and is not systematically embedded across subjects or school structures. Pupil initiative and understanding of diverse viewpoints are inconsistently addressed, and learning outcomes remain largely awareness-oriented rather than transformative.

Influencing factors

As demonstrated in Table 6b, implementation is facilitated when teachers use authentic contexts (e.g. outdoor tasks, social stages, project weeks) and open-ended discussions that allow pupils to make meaning without being steered towards predetermined positions. It is constrained by teacher dependency, a lack of shared language around transformative learning, and weak structural embedding.

(6) Culturally responsive teaching

Current implementation

Derived from Table 6a, teachers implement culturally responsive practices mainly through relational and interactional strategies such as humour, translation, and the creation of a safe classroom environment. These practices primarily address broadening pupils' perspectives on non-Western cultures, rather than explicitly engaging with the cultural diversity present within the classroom. Teachers also mention taking adaptive strategies when handling sensitive topics and contextualising ESD within local urban practices in order to include diverse cultural perspectives. Pupils recognise culturally responsive teaching through the same relational cues, indicating an alignment between the teacher's intentions and the pupils' experiences.

Influencing factors

Implementation of this teaching approach is facilitated by teachers' professional autonomy, relational proximity to pupils, and the necessity to respond to urban super-diversity, which normalises adaptive, language-sensitive, and culturally aware practices. Constraints are structural and conceptual, including the absence of shared teaching strategies and curriculum pressure. Table 6b reveals that, in urban schools operating under high social complexity, culturally responsive teaching thus functions primarily as an inclusion strategy, rather than as a deliberate lever for transformative ESD.

Table 6a. Cross-case comparison of the implementation of ESD from the insights of pupils, teachers, and school leaders of building block 2: effective teaching strategies.

Building Block 2: Effective teaching strategies

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
(5) Transformative learning	**Pupils**	**Experiential learning**	Frequent outdoor tasks (animals, compost)	Occasional creative tasks/mostly theory-based	Limited/mostly videos, information transfer	Practical tasks are remembered when activity-based (e.g. park lesson)	Interactive expo/videos remembered
		Reflection or invitation to express initiative or opinion	Not encouraged, a lot of tasks	Pupils allowed but not motivated to engage	Not encouraged/ information-focused	Sometimes encouraged/depending on the teacher and theme	Initial reflection invited but limited follow-up/mostly teacher-led
	Teachers	**Use of enquiry/critical questioning**	Pro-contra discussion	Task-based (recycling, upcycling), workshop formats	Class discussion leading to shared conclusions	Data use, graphs, interdisciplinary links	Mainly explanatory
		Experiential/authentic contexts	Pupils' lifeworld dilemmas	Material reuse	Material reuse, electricity cost awareness	Climate, financial issues	Reuse
		Focus on learning as a process	Explicit focus on the growth process	Present in isolated projects	Implicit, teacher-dependent	Holistic learning trajectories	Difficult
	School leaders	**Conceptual understanding of TL**	Not explicitly labelled	Not explicitly labelled	Not articulated	Explicitly linked to a holistic approach	Understood as cross-curricular/ project-based
		Structural embedding	Experiential learning seen as transformative	Teacher-dependent (e.g. reading texts in language courses)	Teachers using the same methods/excursions around diversity	Experiential learning seen as transformative	Introduction of various ecological themes over the grades
(6) Culturally responsive education	**Pupils**	**Linguistic support**	Translation support when pupils do not understand	Extra language support	No explicit reference	Translation by teachers	No explicit reference
		Relational safety and trust	Pupils approach the teacher directly	Teacher creates a reassuring atmosphere (humour; listening, including pupils' lifeworld)	No explicit reference	Teachers motivate, listen, encourage, and reduce pressure	Close teacher-pupil relationship, but sometimes distracting
	Teachers	**Inclusion of diverse cultural perspectives**	Free expression/pro–contra discussion/background considered	Explicit inclusion of non-Western, Islamic, Iranian artists	Use of religious references (hadith) in discussions	Systematic attention (e.g. non-European histories and francophone diversity)	Counterbalancing dominant narratives (e.g. sexuality, religion)
		Safe classroom climate	Emphasis on pupil voice and non-directive stance	Non-judgmental climate	Norms and values are discussed explicitly	Humour and open dialogue	Careful handling of sensitive themes/adaptive strategies
		Pedagogical adaptation to diversity	Pupils' own input is seen as important	Pupil choice in topics and formats	Long class discussions/ structured argumentation	Contextualising sustainability via local practices (circularity of their living consumption styles)	Adjustments in group work (e.g. gender-sensitive arrangements)
	School leaders	**School-wide CRE vision**	Cultural diversity is considered in sustainability lessons	Teacher-dependent approach	No explicit vision articulated	No explicit vision articulated	Norms and values prioritised over cultural differentiation
		Structural or pedagogical adaptation to diversity	Coaching hours/flexible practices/ alternative participation admitted (e.g. smell instead of tasting wine)	Language sensitivity acknowledged	None mentioned	None mentioned	CRE is not explicitly embedded at the school level

Table 6b. Influencing factors that facilitate or constrain the implementation of building block 2: teaching strategies.

Building Block 2: Effective teaching strategies						
Characteristics	Influencing factors	School A	School B	School C	School D	School E
(5) Transformative learning	**Facilitators**	Open campus; frequent outdoor tasks/real-life contexts/space for discussion without teacher steering	Project weeks: creative recycling tasks	Teacher-led discussions: material reuse linked to costs and norms	Holistic elements: interdisciplinary links	External activities/ some interactive formats
	Constraints	No explicit encouragement of pupil initiative/TL not named or shared concept	Mostly theory-driven lessons/ pupil disengagement/TL not structurally embedded	Teacher dependency/ opinions rarely solicited/ limited initiative space	TL depends on individual teachers and themes	TL is rarely explicit; learning is mostly explanatory
(6) Culturally responsive learning	**Facilitators**	Active translation/ emphasis on free expression/ cultural background considered (adaptations)	Extra language support/ multilingual interaction/ reassuring teacher style/culturally responsive references used	Structured class discussions/ religious references used in discussions	Teachers translate, and scaffold language/humour and dialogue/ culturally responsive references used	Informal teacher-pupil communication; Careful handling of sensitive topics (counter-narratives added to avoid reinforcing extreme views)
	Constraints	Practices vary by teacher/no explicit link between CRE practices and ESD	Practices vary by teacher/no structural embedding beyond individual teachers	Practices vary by teacher/ no leadership vision was mentioned	Practices vary by teacher/no leadership vision was mentioned	Practices vary by teacher/CRE is not explicitly linked to sustainability at the school level

ESDUC building block 3: community-engagement

Table 7a presents a comparison across schools for building block 3 "community-engagement" (RQ1), and Table 7b shows the main constraints and facilitators (RQ2) for this building block.

(7) Broader community

Current implementation

Across the five schools, engagement with the broader community is unevenly and selectively implemented. Community involvement is most visible where partnerships translate into concrete, practice-oriented activities (e.g. municipal collaborations, welfare-oriented initiatives, NGO-led projects). In several schools, however, community engagement remains limited to cultural outings or pupil support services, and it is not systematically connected to ESD objectives.

Influencing factors

As evidenced in Table 5b, implementation is facilitated when schools maintain stable partnerships with municipalities, NGOs, or welfare organisations and when these collaborations are aligned with school priorities and planning cycles. Community engagement is constrained by a lack of strategic focus on sustainability partnerships, dependence on external funding, and misalignment between external organisations' timelines and school curricula.

(8) Pupil involvement

Current implementation

Across the five schools, pupil engagement in sustainability is present but unevenly implemented. Engagement mainly occurs through formal structures such as pupil councils or through teacher-initiated activities, with limited pupil ownership of sustainability-related decision-making. Only in a few cases do pupils co-design or initiate sustainability actions, and these are typically small-scale, voluntary, and not systematically embedded at the school level.

Table 7a. Cross-case comparison of the implementation of ESD from the insights of pupils, teachers, and school leaders of building block 3: community engagement.

Building Block 3: Community engagement

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
(7) Broader community	**Pupils**	**Type of contact with the neighbourhood**	Participation in municipal park maintenance	Occasional city outings: not sustainability-related	No neighbourhood contact reported	No neighbourhood engagement reported	One-off walks/interviews outside school
		Perceived relevance for school life	Concrete and practical	Incidental, not linked to sustainability	Largely absent	Largely absent	Educational but limited in frequency
	Teachers	**Awareness of existing partnerships**	Low awareness: not all actions are known	Low awareness	External partners are seen as irrelevant for classroom practice	Low awareness, teacher-dependent	Partial awareness of external partners
		Teacher involvement	Absent	Rare and incidental	Absent	Occasional	Involved
		Use of external actors	Youth coaches are valued as external and safe	Difficult one flows with the municipality	External religious/cultural figures suggested for pupils bad behaviour	External actors used for guidance	External experts integrated into projects
	School leaders	**Strategic partnerships**	Strong (municipality, NGOs, poverty organisations)	Limited: focus on internal priorities	Mainly NGOs for food distribution for pupils, external youth coaches	Partnerships for healthy food or gender diversity in sports	Extensive
		Purpose of engagement	Sustainability, poverty reduction, vocational learning	Cultural exposure (arts), logistics (food provision)	Pupil wellbeing and retention	Sustainability, diversity	Sustainability, research, and curriculum alignment
		Structural embedding	Multiple ongoing trajectories	Fragmented, not sustainability-driven	Ad hoc and person-dependent, subsidy-driven for sustainability activities	Multiple ongoing trajectories	Planned, long-term, policy-supported
(8) Pupils	**Pupils**	**Existence of pupil-led structure**	Weekly meetings with "class captains"	Learner council exists	No pupil council	Pupil council exists	Pupil council
		Nature of pupil initiatives	Improvement proposals	Event-based, financial goals (trips, materials)	One-off humanitarian action	Financial pooling for trips	Small-scale charity actions during breaks
		Link to sustainability	Indirect: mainly social or financial	Not sustainability-oriented	Humanitarian-framed	Explicitly not linked to sustainability	Humanitarian
	Teachers	**Teacher mediation of engagement**	Actions communicated via class coach/decisions taken with teachers	Pupils not involved in sustainability actions	Low participation	Pupils are rarely involved/ voluntary help only	Engagement is often teacher-led/pupils are instructed
		Degree of pupil autonomy	Limited: teacher validation required	Absent	Absent: lack of motivation	Low: informal participation	Partial: eco-team allows voluntary involvement
		Nature of initiatives	Ecological, humanitarian, financial	Absent	Absent	Only the perception of living together	Explicit sustainability framing in some actions
	School leaders	**Ownership of sustainability initiatives**	Space exists, but mainly for practical/social issues	Learner council supported if proposals arise	Feedback via unit meetings/ no structural mandate	Pupils involved in the design phase of school spaces	Structured eco-team and SDG-linked workshops
		Institutionalisation of engagement	Project-based	No sustainability-related engagement	Informal, issue-driven	Partial design consultation	Structured cycles (workshops, SDG choice)

Table 7a. (*Continued*)

Building Block 3: Community engagement

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
(9) Parents	**Pupils**	**Visibility of parents in school life**	No parent council	Contact is limited to letters	Parents do not come to school	Parent council stopped	Parental council and occasional participation during research days or events
		Participation in sustainability-related activities	None reported	Pupils say parents do not want involvement	Parents do not come to school	Parents were never involved.	Parents are sometimes present in enquiry-based activities
	Teachers	**limited teacher–parent contact**	Mostly financial or sustainable food-related	Very limited/language barrier noted	Very difficult/attempts failed	Historically low/rebuilding via digital tools	Parents informed but not actively involved
		Context dependent	Food-related practices (cost-conscious, nutrition)	Sustainability is seen as a low priority for parents	Difficult collaboration in urban schools	Not yet linked to sustainability, but willing to	Eco-practices communicated but not co-developed
	School leaders	**Strategic focus on parent engagement**	Minimal; one-way communication	None	Ad hoc initiatives	Rebuilding basic involvement first	An explicit strategy to involve ethnic and culturally diverse parents gradually
		Structural opportunities for involvement	Newsletter/school council	None	Info moments/open class days	Restarted parent contacts and informal contacts during Ramadan (Iftar)	Parent council, iftar, eco-team involvement
(10) Place	**Pupils**	**Frequency of outdoor learning**	Regular (2x/week, routine)	Absent	Absent	Incidental (park, mainly seasonal)	Occasional (subject- and moment-based)
		Type of engagement with the place	Hands-on tasks (animals, compost, maintenance)	Absent	Absent	Observation-based (plants, park visits)	Mixed (parks, workshops, campus use)
		Pupil experience of place	Feeling at ease in nature	No clear experience	No reported experience	Neutral	Positive but teacher-dependent
	Teachers	**Curricular anchoring**	Integrated across activities (e.g. maintenance)	Seen as difficult due to curriculum constraints	Ad hoc, teacher-initiated	Subject-dependent (sports)	Subject-dependent (mainly sciences and sports)
		Use of the local environment	Campus as a learning space	Difficult with the urban context, the nearby park is underused	Limited to single initiatives	Park is used when conditions allow	Park/campus used selectively
	School leaders	**Infrastructure enabling outdoor learning**	Green campus, biotope, outdoor Wi-Fi	Limited, external spaces only	Minimal	Park proximity leveraged	Campus and external sites available
		Strategic vision on place-based learning	Explicit and subsidised	Implicit, secondary priority	Project-based only	Encouraged when possible (weather, subject-dependent)	Encouraged, but teacher choice

Table 7b. Influencing factors that facilitate or constrain the implementation of building block 3: community engagement.

Building Block 3: Community engagement						
Characteristics	Influencing factors	School A	School B	School C	School D	School E
(7) Broader community	**Facilitators**	Municipal and NGO partnerships enable hands-on sustainability and social support	Access to nearby cultural institutions	Welfare-oriented partnerships support pupil care	Prevention networks and subsidies support engagement	Structured long-term partnerships aligned with the curriculum
	Constraints	Limited teacher awareness	Sustainability partnerships are not prioritised	Lack of sustainability-focused community partners/ difficulties with pupils' behaviours	Project-based engagement	High coordination load/timing mismatch with external partners
(8) Pupils	**Facilitators**	Teacher-supported initiatives linked to pupils' lifeworld; Occasional co-decision (e.g. fundraising)	School leadership is open to supporting pupil proposals	Incident-driven engagement (e.g. charity action)/unit-level signal flow via coaches	Co-design moments/ Teacher-led projects with limited pupil participation	Multiple action formats (eco-team, workshops, exchanges)/ voluntary participation across different pupils
	Constraints	Sustainability initiatives are often teacher-initiated	Sustainability is absent from pupil initiatives	Low pupil motivation for extra engagement	Engagement is fragmented and not school-wide/ voluntariness limits scale and continuity	Partial involvement of pupils
(9) Parents	**Facilitators**	Food-related engagement via nutrition school; affordable school costs	None identified	Occasional information moments	Restart of parent contacts via digital tools	Parent council; iftar; eco-team with parent expertise
	Constraints	No parent council; one-way communication; parents not involved	Contact limited to letters; language barriers; sustainability low priority	Parents absent; failed attempts at involvement; poverty and survival priorities	Parent council stopped; sustainability not yet linked to parent engagement	Language barriers; participation dependent on timing and availability
(10) Place	**Facilitators**	Green campus/routine outdoor use/ subsidies	Proximity of the park/links with cultural institutions	Project-based initiatives	Park access/ leadership encouragement/ subject-based use	Campus/external sites/experiential framing
	Constraints	Dependence on funding	Curriculum pressure/ regulatory barriers/weak anchoring	Low continuity/no structural support	Seasonal dependence/ uneven teacher uptake	Strong subject-dependence/ uneven teacher willingness

Influencing factors

Implementation is facilitated when schools provide formal participation structures, link initiatives to pupils' lived experiences, and offer concrete opportunities for co-design. Implementation is constrained by low pupil motivation, priority is given to financial goals for engagement rather than to sustainability-oriented goals, strong teacher steering, and the absence of a shared school-wide vision on pupil-led sustainability, resulting in fragmented and incidental engagement rather than sustained participation.

(9) Parental engagement

Current implementation

Across the five schools, parental engagement is weakly implemented, difficult, and remains peripheral to ESD. Parents are mostly absent from school life or are involved only through informational channels. Sustainability-related engagement with parents is rare and, where present, limited to isolated practices (e.g.

food-related routines or single projects). Only school E shows structural integration, where parents contribute expertise through a parent council, eco-team activities, or culturally responsive initiatives.

Influencing factors

As indicated in Table 7a, implementation is facilitated when schools create low-threshold, culturally responsive entry points, such as food-related practices, informal cultural encounters, or projects that draw on parents' expertise. Constraints are primarily structural and contextual: language barriers, socio-economic vulnerability, inaccessibility, limited time availability, and schools' reliance on one-way communication. Sustainability across schools is largely school-owned rather than a shared responsibility with parents, limiting sustained parental engagement beyond minimal participation.

(10) Place-based education

Current implementation

Derived from Table 7a, place-based education is only partially implemented across schools and remains uneven across schools. Where access to green spaces or nearby urban facilities exists, outdoor learning supports experiential engagement with ESD mainly within specific subjects. However, these practices are not systematically embedded and are rarely recognised by pupils as part of ESD.

Influencing factors

As shown in Table 7b, implementation is facilitated by proximity to urban resources and leadership support for outdoor learning. It is constrained by curriculum pressure, regulatory limitations, weather conditions, and funding dependence, making place-based education highly teacher-dependent and weakly institutionalised.

ESDUC building block 4: school culture

Table 8a presents a comparison across schools for building block 3 "school culture" (RQ1), and Table 8b shows the main constraints and facilitators (RQ2) for this building block.

(11) Whole-school approach for ESD

Current implementation

Across the five urban secondary schools, ESD is weakly implemented in the school cultures, as shown in Table 8a. Instead of functioning as a whole-school approach, ESD is mainly implemented through isolated initiatives and subjects, and through the commitment of individual teachers or teams. School cultures, therefore, reflect a fragmented approach, in which sustainability is visible but not structurally integrated, and rarely recognised as a core, collectively owned educational responsibility.

Influencing factors

Implementation is facilitated when schools provide structural support for bottom-up initiatives, the existence of shared responsibility, and when sustainability is made visible through shared tangible practices. As a result, most schools position themselves doing education *for* sustainability development rather than education *about* sustainable development. However, implementation is constrained by the absence of a shared vision, insufficient collective knowledge for alignment, coherent guidelines for ESD, and strong dependence on individual actors. In super-diverse urban contexts, competing priorities such as socio-economic vulnerability, workload, and basic educational needs further weaken implementation of a WSA for ESD.

(12) Intercultural school culture: recognition of diversity

Current implementation

Across the five schools, recognition of cultural diversity is implemented primarily through practical cultural adaptations and relational practices and is most visible in everyday school routines (e.g. food provision, proposing vegetarian/halal options, adjusting prices to lower costs, communication with parents) or

Table 8a. Cross-case comparison of the implementation of ESD from the insights of pupils, teachers, and school leaders of building block 4: school culture.

Building Block 4: School culture

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
(11) Whole-school approach	**Pupils**	**Visibility of sustainability in school life**	Present mainly through concrete actions	Weak and fragmented	Limited pupil awareness	Pupils notice actions but not a coherent vision	High visibility (eco-team, green campus, posters)/meaning often unclear
		Understanding of the school vision	Linked to specific subjects rather than a school-wide vision	Largely absent; pupils unsure of any shared vision	No explicit link to sustainability	No explicit link to sustainability	Sustainability "lives", but without a clear explanation or framing
	Teachers	**Explicit school vision on ESD**	Not explicitly embedded in vision/present in rules and actions	No shared or written vision	Sustainability is not central to the mission	Vision fragmented and not named as sustainability (more as living together)	Vision not formalised/ESD spread across initiatives
		Structural support for initiatives	Support by creating a place for it	No strategic focus	Not mentioned	Not mentioned	Support by creating a place for it
		Collective efficacy	Through coordinators and shared responsibility of one's actions (trash, cleaning up)	None; driven by a small "green" group	Fragmented; dependent on individual teacher initiatives	Mostly individual practices/ limited alignment/shared responsibility of one's actions (running tap)	Growing coherence, shared responsibility of one's actions (train instead of plane)
	School leaders	**Level of ESD integration**	Education *for* sustainable development/no formal policy	Education *about* sustainable development/no formal policy	Education *for* sustainable development/ESD embedded indirectly in broader mission	Education *for and about* sustainable development/ policy under development/ needs guidelines	Education *for and as* sustainable development/vision exists "in the head", not yet formalised/ needs guidelines
		Leadership practices for sustainability	Facilitating policy groups/ providing materials/the teacher as a role model	Cost-driven decisions dominate (plane cheaper than train)	Leadership focuses on wellbeing and the feasibility of initiatives/cost-driven (free food, public transport instead of bus)/a lot of dialogue/ facilitating policy groups	Strong directive leadership, sometimes imposed/selective prioritisation/cost-driven initiatives (free bread)	Enabling leadership with strong resourcing and space (releasing from teaching)/providing materials/explicit need for a coherent ESD framework
		Collective structures and continuity	Supported by the teachers, but there is insufficient knowledge to integrate ESD in all subjects	Weak collective structures (except the eco-day)/low staff engagement (teacher dependent)	Unit-based organisation supports continuity beyond individuals	Emerging structures via coordinators and councils	Strong collective mechanisms (recurring actions, initiatives), but dependent on key actors
(12) Intercultural school culture: Recognition of diversity	**Pupils**	**Experienced inclusion in everyday school life**	Practical accommodations (food-halal provision)	Limited sense of school-wide safety/belonging for some pupils	Headscarf ban experienced as exclusionary	Not mentioned	Freedom of religious choice/the ban on headscarves, religious symbols, and clothing could be exclusionary for some
		Access to trusted mediators	Multilingual liaison figures with parents	Multilingual liaison figures with parents	Belonging concentrated in specific liaison staff, rather than the school as a whole	A culturally resonant liaison figuer is seen as understanding sensitivities and helping with difficult situations	None
	Teachers	**Culturally responsive interaction in urban contexts**	The school ethos of non-judgement and "everyone can	Intercultural approach described as mostly individual (limited shared policy)	Difficulties with the pupil profile and their urban context/home	It's within the school's DNA to be actively involved in cultural diversity	Take into account daily

Table 8a. (*Continued*)

Building Block 4: School culture

Characteristics	Perspectives	Sensitising concepts	School A	School B	School C	School D	School E
			be themselves" is explicitly referenced		situation are being taken into account		
		Cultural accommodations	School-wide anti-racism/civic inputs (speakers/visits) used to address diversity	Practical accommodations (e.g. halal) noted	Accommodation for Ramadan or halal cooking	Monocultural pupil intake noted despite "multicultural" assumptions	Accommodations around Ramadan, praying, excursions (e.g. trip to places of worship)
		Tension between monolinguistic policy and lived diversity	Multilingual liaison staff used for parent contact/sustainably adjusting prices for the pupils	Reliance on multilingual and multicultural administrative staff is seen as crucial/no diversity in teaching staff (nobody from Brussels)	Reliance on multicultural and multilingual staff is seen as crucial/limited budget capacity and teacher shortage	Difficulty with monolingual school policy and reality/ individual teachers do not need a liaison figure in communication with parents	Reliance on Islamic staff to match what is true, and not by pupils/ pupils gather in groups of cultural diversity at a younger age
	School leaders	**Institutional acknowledgement of super-diversity**	Practical accommodation in school routines (e.g. Ramadan/ headscarf space, ingredient clarity, veggie option, Arabic cookies when Eid al-Fitr)/ intercultural projects (trip to places of worship); policy group around poverty/ systematic monitoring of pupil needs via learner-tracking	Inclusion framed through care, listening, inclusion (receiving a bag of candy during Eid al-Fitr, halal option), and poverty-response measures (food support, coaching)/ transportation adaptations to cover costs for pupils	Working in a connected way, low-threshold parental involvement, and creating education together (recruitment of diverse staff and former students)/good awareness of the very poor student population, so working cost-effectively on trips/even with misbehaviour, they continue to offer 2 cultural activities to give them a bit of culture	Working in a connecting way, low-threshold parental involvement (family-facing practices: sexuality, gender, teenage pregnancies), recruitment for intercultural competence and local embeddedness;/project for healthy eating (because not always getting it at home)	Low-threshold parental involvement (family-facing practices, e.g. iftar timing, teenage brain)/attention to staff recruitment
		Inclusive communication	A lot of liaison figures	Multilingual parent communication strategy (bilingual contacts, translation support)/monolingual policy for pupils, but exceptions, when necessary/a lot of liaison figures	Language norm maintained, but flexibility in language adaptation for understanding with parents/a lot of liaison figures	Language norm maintained, but flexibility in language adaptation for understanding with parents/liaison figure	Bilingual communication framed as key inclusion strategy/ intercultural liaison figures from Brussels
		Weak anchoring of interculturality within ESD school culture	Commitment to staff training on multiculturality and poverty-awareness/implicitly not linked to the ESD approach	Plan to formalise via diversity charter and professional learning/implicitly not linked to ESD	Implicitly not linked to ESD	Implicitly not linked to ESD	Explicitly not linked to ESD

Table 8b. Influencing factors that facilitate or constrain the implementation of building block 4: school culture.

Building Block 4: School culture						
Characteristics	Influencing factors	School A	School B	School C	School D	School E
(11) Whole-school approach	**Facilitators**	Active ecoteam and policy groups/visible school-wide actions/ material support/ collective efficacy/green campus	Annual thematic day/ very small group of motivated teachers/ basic infrastructure (waste sorting)	Unit-based autonomy/ focus on care, guidance, and practical organisation/ openness to initiatives	Strong leadership drive/gradual policy consolidation	Strong ecoteam/ external networks/ visible green campus/collective efficacy
	Constraints	Sustainability is not embedded in the formal school vision/ limited teacher time	No shared vision/ leadership, not modelling sustainability/ fragmented engagement	No explicit approach: ESD seen as a growth process and wellbeing	Fragmented practices: a need for guidelines	Vision not formalised/ need for guidelines/ initiatives remain project- and actor-based/limited internal coordination
(12) Intercultural school culture: recognition of diversity	**Facilitators**	Clear school vision emphasising acceptance and non-judgement/ structural supports/ providing training	Explicit leadership focuses on inclusion/ planned professionalisation	Strong care-oriented approach addressing poverty and wellbeing/ learner guidance structures (coaches, food support, mentoring)	Interculturality embedded in school DNA and leadership discourse/ restorative and community-based leadership practices	Recognition through religious accommodations/ leadership support for bilingual communication, and inclusive parent events/providing training
	Constraints	Intercultural approach not linked to ESD approach/ dependence on specific staff roles for continuity	Limited diversity within teaching staff/ cost constraints shaping sustainability choices/intercultural approach not linked to ESD approach	Headscarf ban experienced as exclusionary by pupils/high staff workload and fragility of initiatives over time/ intercultural approach not linked to ESD approach	Monocultural pupil population limits lived diversity/ intercultural approach not linked to the ESD approach (needs guidelines)	Policy rules restricting visible religious expression/ persistent language barriers with parents/intercultural approach not linked to the ESD approach (needs guidelines)

intercultural projects or attentions, while its connection to sustainability goals remains implicit and weakly articulated. Teachers and pupils experience inclusion mainly as a matter of a safe and caring learning environment with mutual respect, not as a pedagogical dimension of ESD. Derived from Table 8a, school leaders acknowledge intercultural diversity as part of their school context but rarely frame it as an integral element of a WSA to ESD, and they express the need for a comprehensive framework.

Influencing factors

Implementation is facilitated when schools institutionalise relational support structures, such as multilingual communication, reliance on multicultural and multilingual liaison figures, learner guidance systems, and leadership practices that emphasise trust and inclusion. Recognition of diversity is further strengthened when school leadership actively operationalises intercultural competence through recruitment, professionalisation, and inclusive school narratives. However, implementation is constrained by the absence of formal policy anchoring, the monolingual school reality, reliance on individual actors, teacher shortage, and competing priorities linked to socio-economic vulnerability, workload, and budgetary limitations. Restrictive regulations (i.e. neutrality charter - ban on religious symbols) and limited pedagogical translation further weaken coherence.

Discussion

This discussion follows the two research questions. It first explores differences in ESD implementation (RQ1), focusing on divergent perceptions and the varied implementation of the ESDUC building blocks. It then

examines the main facilitators and constraints influencing ESD implementation in super-diverse urban contexts (RQ2). Building on these findings, the implications for ESD within super-diverse urban realities are discussed. Finally, the use of the ESDUC framework is reflected upon, including its implications for transdisciplinary ESD.

Divergent perceptions of ESD implementation

Across the four ESDUC building blocks, a discrepancy emerges between how implementation is understood and recognised by pupils, teachers, and school leaders. As demonstrated through Tables 5a, 6a, 7a, and 8a, pupils primarily experience sustainability and intercultural practices through tangible, everyday routines and their interactions with individual teachers. In contrast, most teachers describe implementation in terms of pedagogical intentions and isolated practices embedded within their teaching subject (e.g. the integration of multicultural references). School leaders, in contrast, position implementation at a more organisational level, emphasising support structures, feasibility, or a positive school environment, rather than implemented learning processes which also means they do not always know what actually happens during lessons (e.g. they tend to conceptualise pupils' sustainability competences as learning to live together and systems thinking, yet pupils tend to frame these competences primarily in terms of basic ecological actions).

These divergent perspectives suggest that implementation is not only inconsistent across schools but also fragmented across actor groups. What teachers or school leaders interpret as meaningful implementation often remains implicit or barely visible to pupils, especially when sustainability or interculturality is embedded indirectly or framed as general pupil welfare, discipline, or wellbeing. This factor points to implementation that is present in form, but only weakly articulated pedagogically, limiting pupils' recognition of ESD as a coherent and meaningful learning domain.

Varied implementations of the ESDUC building blocks across schools

As shown in Tables 5a, 6a, 7a, and 8a, the ESDUC building blocks are implemented across the five urban secondary schools in different ways, confirming that implementation is context dependent. Competences and teaching strategies are implemented at the level of awareness and repetition, while community engagement and school culture show greater variation, largely shaped by leadership priorities, available structures, and schools' historical trajectories. Only one school demonstrates relatively coherent alignment across multiple building blocks, suggesting that implementation is possible but not common. These differences appear less related to commitment than to divergent interpretations of what "doing ESD" entails in practice. In most schools, ESD takes shape as supportive or compensatory responses to urban challenges, rather than as integrated educational goals. This helps explain why sustainability is often weakly institutionalised: elements of ESD are present, but rarely aligned into a shared, school-wide approach.

Shared constraints and facilitators of ESD in super-diverse urban contexts

Across schools, implementation is shaped by a largely shared set of facilitators and constraints (see Tables 5b, 6b, 7b, and 8b). Facilitating factors include the presence of committed individual teachers, relational trust with pupils, cultural and religious-linguistic sensitivity, attention to cost and practical accommodations, and supportive leadership that allows bottom-up initiatives. These factors allow ESD-related practices to emerge, even in the absence of formal policy or explicit frameworks. At the same time, this reliance on individual actors makes implementation fragile and uneven. Constraints are strikingly similar across schools and building blocks. Structural pressures such as workload, curriculum demands, budgetary limitations, socio-economic vulnerability, and regulatory frameworks limit continuity and coherence.

In these super-diverse urban contexts, the observed schools often prioritise immediate educational and social needs, which position ESD as secondary or incidental. Consequently, sustainability and intercultural recognition function more as adaptive responses to complexity than as deliberately designed components of a WSA. Synthesising these findings (or, in sum), implementation gaps appear to reflect not resistance or

lack of goodwill, but the absence of connective structures in the form of frameworks that enable schools to translate contextual sensitivity into coherent pedagogical and organisational practices.

ESD implementation within super-diverse urban realities

This study aimed to identify cross-cutting patterns across the five schools and, in doing so, highlights how profoundly ESD implementation is influenced by the distinct characteristics of super-diverse urban contexts, with Brussels as a particularly pronounced case. Brussels represents one of Europe's most super-diverse metropolitan regions, characterised by a majority-minority population, multilingualism, and strong socio-economic polarisation. The urban realities described in the introduction (i.e. a spatially dense urban fabric, linguistic plurality, educational inequality, socio-economic vulnerability, and culturally heterogeneous lived experiences) are likely to be transferable to other super-diverse urban contexts and are not merely background conditions but actively structure how ESD is interpreted, implemented, facilitated, and constrained in practice.

A key pattern emerging across the cases investigated in this study is the structural gap between pupils' lived urban realities and the (demographic and cultural) profiles of teaching staff (see Table 5b). While a significant number of pupils in Brussels largely grow up in multilingual, culturally diverse environments shaped by migration, poverty, and dense urban infrastructures, most teachers do not share these lived experiences and often commute from outside Brussels (originating from regions characterised by less diversity). This demographic and experiential mismatch (intensified in Brussels by monolingual language policies and neutrality regulations) may help account for the recurring gap observed across the ESDUC building blocks between teachers' intentions and pupils' recognition of ESD. Importantly, this type of misalignment is not unique to Brussels and is likely transferable to other (super-)diverse metropolitan contexts, as similar gaps between pupils' lived realities and school practices have been widely documented in international research (e.g. Milner et al. 2015).

Teachers frequently expressed goodwill and sensitivity, yet simultaneously reported uncertainty about how to connect ESD to pupils' cultural backgrounds, economic constraints, or urban lived experiences without reinforcing conflict or polarisation. This aligns with our findings (see, among others, Table 5a), i.e. the broader didactical gap identified earlier, whereby ESD remains dominated by repetition and behaviour-oriented or ecological reductionist logics rather than by transformative pedagogies. In urban contexts, this gap becomes more acute: ecological framings that neglect social and economic entry points may provoke resistance rather than engagement, as sustainability discourses may be experienced as distant or economically burdensome when disconnected from pupils' lived realities (Urberg and Öhman 2024). As a result, sustainability and intercultural practices are frequently implemented as care-oriented, compensatory, or pragmatic responses rather than as explicitly pedagogical or transformative processes. What pupils experience as inclusion or recognition often takes the form of relational safety, flexibility, or individual understanding, rather than explicit engagement with sustainability as a socio-cultural and political issue rooted in their everyday lives.

Although common constraints and facilitators cut across the cases, the implementation of the ESDUC building blocks varied depending on each school's social composition, institutional history, leadership priorities, and proximity to pupils' everyday realities. Grouping these contexts risks obscuring the fact that ESD is shaped not merely by "urbanity" per se, but by different configurations of super-diversity, socio-economic vulnerability, and organisational capacity. Across the Brussels schools, sustainability practices were frequently adapted to immediate urban realities, such as financial precarity, linguistic mediation needs, and care needs, yet these adaptations took divergent forms, reflecting differentiated responses to urban constraints rather than simple variation in commitment, reinforcing the argument made in the second discussion section. This finding aligns with literature on transdisciplinary sustainability learning, which emphasises the importance of connecting educational practices to real-world problems and societal challenges (e.g. Lang et al. 2012).

Against this backdrop, intercultural and multilingual support roles emerge as structurally significant actors in urban ESD implementation. Across schools, liaison figures such as pupil counsellors, learner coaches, youth workers, and multilingual administrative staff play a crucial role in mediating between monolingual school policies and multilingual family realities, facilitating communication with parents who

are often hard to reach or absent from formal school spaces. However, their contribution remains largely positioned outside the pedagogical core of ESD, functioning as informal enablers of inclusion rather than as recognised contributors to ESD. From a theoretical perspective, this positioning can be interpreted through the lens of boundary crossing, where boundary actors facilitate coordination across practices without necessarily becoming structurally integrated into teaching and learning processes (Akkerman and Bakker 2011). Given that such demographic and institutional configurations are characteristic of super-diverse urban contexts, similar patterns may be expected in other urban school systems, although further comparative research is needed to substantiate this transferability. At the same time, these findings point to a structural gap in teachers' professional preparedness: Flemish teachers report relatively limited preparedness, alongside more pronounced needs for professional development related to teaching in contexts characterised by higher levels of pupil diversity (Van Droogenbroeck et al. 2025).

This variation is particularly visible across the ESDUC building blocks. Competence development and teaching strategies are shaped by pupils' lived urban realities, yet they are not consistently translated into transformative learning, despite teachers' expressed desire for more contextualised approaches. Community engagement and school culture show the strongest contextual differentiation, where schools can draw on stable local networks or culturally embedded staff, and ESD practices gain coherence. In schools facing leadership instability or staff turnover, school teams struggle to move beyond fragmented initiatives. These patterns confirm that super-diverse urban contexts do not merely add complexity to ESD implementation but actively reshape what ESD becomes in practice.

The findings also highlight urban diversity as both a challenge and a resource for ESD. Pupils' lived experiences include forms of "everyday sustainability" rooted in necessity: repairing, sharing, reusing, or supporting family networks. Yet these practices are rarely recognised as a legitimate sustainability entry point for transformative learning within school discourse. This disconnect contributes to the persistent gap between teachers' intentions and pupils' recognition of ESD, observed across several building blocks. Re-anchoring ESD in pupils' urban lived experiences, therefore, requires recognising these practices not as deficits but as starting points for agency and meaning making (André and Westerveen 2024; Welsh and Swain 2020).

At the same time, super-diverse urban contexts amplify structural tensions already present in ESD implementation. Teachers report difficulties addressing intercultural tensions and socio-economic sensitivities without clear pedagogical guidance, while school leaders navigate competing priorities in which wellbeing and inclusion often precede sustainability as an explicit educational goal. As a result, despite long-standing calls for whole-school approaches to sustainability, ESD is likely to function as an adaptive response to urban complexity rather than as a deliberately designed whole-school strategy (Sterling 2001).

In summary, in the Brussels cases, several dynamics seem closely connected to super-diverse urban realities, including limited forms of community co-creation (e.g. inaccessible parents), the prominence of cultural accommodations (e.g. food choices), and a strong emphasis on creating caring and safe learning environments. These dynamics, alongside funding dependence and the weak integration of culturally responsive education within ESD, may be indicative of broader patterns in other (super-)diverse urban schools, although further comparative research would be needed to substantiate their transferability. At the same time, other challenges observed across the cases, such as fragmentation of ESD initiatives, curriculum constraints, ecological reductionism, and the absence of structural integration reflected in isolated practices or reliance on individual teachers, align with well-documented implementation challenges in ESD more broadly (Rickinson 2001). The ESDUC framework, therefore, shows potential beyond Brussels, including in less diverse or non-urban contexts, provided that its application explicitly accounts for contextual adaptation rather than uniform benchmarks.

Reflecting on the use of the ESDUC framework in super-diverse urban contexts and its implications for transdisciplinary ESD

This study did not aim to validate or modify the ESDUC framework, but to apply it as an analytical lens to map existing practices, identify influencing factors, and highlight areas requiring targeted action in super-diverse urban secondary schools. Applying the framework empirically revealed both its analytical value and its limitations when confronted with urban educational realities characterised by socio-economic

vulnerability, multilingualism, and intercultural complexity. While ESDUC provides a coherent structure to examine competences, teaching strategies, community engagement, and school culture, the findings show that these building blocks are configured differently in super-diverse urban contexts than what is assumed in more generic ESD framings.

Although ESDUC incorporates community engagement, the framework does not adequately prioritise community actors as equal, strength-based partners in ESD. In Brussels schools, intercultural coaches, pupil counsellors, multilingual administrative staff, families, and local organisations play a crucial role in enabling trust, continuity, and inclusion. Yet these actors function mainly as informal or compensatory support rather than as pedagogical resources. This highlights the need for future applications of ESDUC to more explicitly operationalise community-based and strength-oriented engagement in super-diverse urban settings.

A second point of integration in the framework concerns the starting points for sustainability discourses. Sustainability was predominantly understood and implemented in ecological terms (see Table 5a), while social and economic dimensions remained weakly articulated, reflecting patterns reported in earlier research (Cifuentes-Faura et al. 2020). In urban contexts marked by inequality and diversity, such narrow framings risk disengaging pupils and reinforcing perceptions of sustainability as distant from their everyday lives and economically burdensome, potentially provoking frustration and resistance (Urberg and Öhman 2024). A more pluralistic approach is therefore needed, one that deliberately integrates pupils' values and lived experiences (Kowasch and Lippe 2019; Stevenson 2022). In super-diverse urban secondary schools, learning is deeply embedded in out-of-school realities (Welsh and Swain 2020). Pupils' lived experiences are shaped by community conditions, mobility, housing, poverty, and access to green space, offering powerful but underutilised entry points for transformative ESD that can foster engagement, agency, and belonging. At the same time, these contexts require pedagogies capable of addressing linguistic diversity, social inequality, and the tensions and conflicting interests inherent to sustainability issues. Therefore, to create meaningful learning, ESD should start with pupils' social, economic, and cultural realities and be supported by multi-stakeholder collaborations that mobilise diverse forms of capital (Lotz-Sisitka et al. 2015). Recognising lived sustainability practices, such as sharing, repairing, or cost-conscious consumption (see Table 5a), emerged as a missed opportunity within existing framings.

Applying ESDUC also revealed a structural misalignment between pupils living urban realities and the demographic and cultural composition of teaching staff, a dimension not explicitly addressed in the framework. While ESDUC includes intercultural competence and school culture, it does not fully capture how this misalignment impedes the feasibility of transformative and culturally responsive ESD, leading sustainability practices to be implemented primarily as care-oriented or compensatory responses.

Overall, applying ESDUC in this setting underscores the need to highlight contextual differentiation rather than uniform benchmarks, and to connect transformative pedagogy with intercultural competence, lived sustainability practices, and community-based knowledge more explicitly. In super-diverse urban contexts, ESD is inextricably linked to questions of inequality, diversity, and everyday urban realities. This has concrete implications for the types of competences that become relevant, including intercultural understanding (Catarci 2021) in complex socio-cultural environments. This reflects a persistent didactical gap between pluralistic ESD approaches, which emphasise sustainability competences and action competence (Sass et al. 2024), and the dominant knowledge-transfer model found in schools.

Finally, the application of ESDUC in this study also highlights limitations related to transdisciplinary learning. While the framework captures interactions across school levels and with external actors, the practices observed in the five schools cannot be described as authentically transdisciplinary. Community engagement largely remains instrumental or supportive, rather than co-creative, and external actors are seldom positioned as equal knowledge holders in ESD. This reflects not a lack of ambition but the structural constraints of super-diverse urban secondary schools, where socio-economic vulnerability and care-oriented priorities limit sustained co-design with societal actors.

Conclusion

This multiple case study investigated the current implementation of ESD in super-diverse urban secondary schools, with Brussels as the empirical context. While global frameworks emphasise the multidimensionality of sustainability competences, empirical research has largely overlooked the realities of super-diverse urban

schooling, where issues of inequality, interculturality, and limited access to nature shape how sustainability is learned and enacted. To address this gap, the ESDUC framework was applied as an analytical lens to triangulate qualitative data from school leaders, teachers, and pupils across multiple schools. This approach made it possible to map how far ESDUC-building blocks are present in practice (RQ1) and where contextual opportunities and constraints exist (RQ2).

Across the five schools, the findings show that the ESDUC building blocks are only partially implemented. Sustainability is predominantly framed in ecological terms, with limited attention to social, economic, and intercultural dimensions. Teaching strategies largely rely on awareness-raising and repetition of small actions, while transformative and culturally responsive approaches remain limited. Community engagement and place-based education are weakly embedded, and whole-school approaches to ESD are fragmented and strongly dependent on individual actors. At the same time, the study identifies clear contextual facilitators and constraints shaping implementation. Facilitating factors include committed teachers, relational trust with pupils, and support roles such as learner coaches or intercultural staff, which enable schools to respond pragmatically to super-diversity. Constraints are remarkably consistent across schools and building blocks: socio-economic vulnerability; curriculum pressure; budget constraints; limited professional development; teacher turnover; and regulations restrict continuity and pedagogical ambition.

In conclusion, the findings demonstrate why the ESDUC framework matters for addressing ESD in urban secondary education. The framework makes visible that ESD cannot be reduced to environmental actions alone, but requires the alignment of competences, teaching strategies, community engagement, and school culture. In super-diverse urban contexts, this alignment is particularly crucial, as ESD is inseparable from issues of inequality, interculturality, and pupils' everyday realities.

This study contributes to the literature in three ways. First, it empirically demonstrates how global ESD frameworks are translated into practise in super-diverse urban secondary schools, revealing systematic gaps between policy ambitions and lived practice. Second, it highlights intercultural competence for both pupils and teachers, pupils' engagement, and community-based engagement as central conditions for meaningful ESD in super-diverse urban contexts. Third, it shows the value of ESDUC as a holistic mapping tool that captures organisational and relational dimensions.

While this study does not propose modifications to the ESDUC framework, its application indicates that future use in urban contexts requires strong attention to contextual differentiation. The Brussels case illustrates both context-specific challenges and more general urban patterns, offering insights that can inform the adaptation of ESD frameworks in other super-diverse or less diverse education systems, while also pointing to elements that were not yet sufficiently captured in the initial conceptualisation. The framework should therefore be understood as an evolving construct, with clear potential beyond Brussels, including in non-urban settings, provided that schools and policymakers adapt its application to local realities. For super-diverse urban secondary schools, the findings point to the need for sustained structural support, professional development towards teaching strategies, and whole-school approaches, including community co-creation that roots sustainability to pupils' lived urban experiences and community resources. In this way, ESDUC can support step-by-step and context-sensitive progress towards ESD that is both educationally meaningful and socially just.

Limitations and future research

This study has several limitations that need to be acknowledged. First, the ESDUC framework was applied as an analytical lens rather than to be tested or validated. As such, the findings are dependent on how the building blocks were operationalised through interviews and focus groups, which mainly capture perceived practices rather than observed classroom implementation. This limits claims about depth and quality of implementation and points to the need for future intervention and design-based studies using ESDUC more explicitly as a developmental tool.

Second, the study relied on a small number of participating schools within one super-diverse urban context. While this allowed for in-depth analysis, it limits generalisability. Besides, field study challenges, including variations in teacher availability, pupil engagement levels, and conversational flow, occasionally impeded the exploration of ESDUC. Future research should include comparative studies across different urban contexts and school systems to examine how specific configurations of diversity, governance, and resources shape ESD implementation.

Third, linguistic and socio-economic indicators were employed as pragmatic proxies for diversity in the selection of cases, reflecting the policy practices of the Flemish education system. This single-axis approach constitutes a methodological limitation. Nevertheless, the study consistently attends to multiple forms of diversity, as the framework adopts a super-diverse analytical lens. Future research should therefore adopt a more intersectional lens to capture more adequately how diversity shapes ESD implementation in super-diverse urban schools. One possible way forward is a Delphi study to assess the framework's relevance, clarity, completeness, and specificity, complemented by research in other super-diverse urban areas to strengthen transferability and refine the framework further.

In terms of recommendations, the findings suggest that strengthening ESD in super-diverse urban schools requires targeted support rather than generic policy prescriptions. This includes professional development focused on intercultural and transformative pedagogy, structural time and resources for cross-curricular collaboration, and explicit recognition of community actors as educational partners. Additionally, in line with pupils' and teachers' ideal visions for ESD expressed in this study, such as increased opportunities for place-based excursions, attention to mental well-being, a clear vision for sustainability incorporating cultural diversity and sensitivity, and community initiatives (e.g. school gardens), future research could explore how such practices can be systematically embedded into urban secondary schools. The ESDUC framework has the potential to support such developments, particularly when used reflexively to identify gaps and guide context-sensitive action rather than as a uniform benchmark.

Author contributions

CRediT: **Saphia Zenasni:** Writing – original draft; **Tom Emile Kuppens:** Supervision; **Iris Stiers:** Supervision; **Jill Surmont:** Supervision; **Joost Vaesen:** Supervision.

Funding

This work was supported by internal grants of the supervisor team from Vrije Universiteit Brussel and received financial support from MILO (BAS 53).

Notes on contributors

Saphia Zenasni is a PhD researcher at the Multidisciplinary Institute for Teacher Education at Vrije Universiteit Brussel. Her research focuses on education for sustainable development and transformative learning methods that consider cultural diversity in secondary education. Alongside her PhD studies, she teaches in secondary education. As an economist, she emphasises the importance of addressing sustainability issues with adolescents and introducing them to the concept of a circular economy.

Tom Kuppens is an assistant professor in economics teaching methodology and education for sustainable development at Vrije Universiteit Brussel and Hasselt University. His research focuses on transformative learning for sustainable development, especially within the context of economics and business education.

Iris Stiers is an assistant professor in science teaching. Her research addresses game didactics for science, (blended) STEM, environmental education, wetland resilience, and biological invasions.

Jill Surmont is an associate professor in (foreign) language teaching. Her research focuses on multilingualism and multilingual education.

Joost Vaesen is affiliated with the Multidisciplinary Institute for Teacher Training (MILO) and the history programme of the Vrije Universiteit Brussel. His current research interests focus on societal issues in the super-diverse city-region of Brussels, such as dealing with (controversial) historical figures in public space.

Disclosure statement

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ORCID

Saphia Zenasni 0000-0001-7672-1566

Data availability statement

Due to the pseudonymised nature of the data and the absence of consent for public sharing, the raw data cannot be made publicly available. However, a detailed protocol describing all procedures is provided as supplementary material to this manuscript.

References

Akkerman SF, Bakker A. 2011. Boundary crossing and boundary objects. Rev Educ Res. 81(2):132–169. https://doi.org/10.3102/0034654311404435

Alkaher I, Tal T. 2016. Making pedagogical decisions to address challenges of joint Jewish–Bedouin environmental projects in Israel. Int Res Geogr Environ Educ. 25(1):4–19. https://doi.org/10.1080/10382046.2015.1106115

André G, Westerveen L. 2024. Contrasting approaches to educational equality: an intersectional perspective on educational policies in Belgium. J Educ Policy. 40:1–19. https://doi.org/10.1080/02680939.2024.2435354

Bianchi G. 2020. Sustainability competences. Publications Office of the European Union. https://doi.org/10.2760/200956

Boeve-de Pauw J, Gericke N, Olsson D, Berglund T. 2015. The effectiveness of education for sustainable development. Sust. 7(11):15693–15717. https://doi.org/10.3390/su71115693

Boeve-de Pauw J, Van Petegem P. 2013. A cross-cultural study of environmental values and their effect on the environmental behavior of children. Environ Behav. 45(5):551–583. https://doi.org/10.1177/0013916511429819

Braun V, Clarke V. 2021. One size fits all? What counts as quality practice in (reflexive) thematic analysis? Qual Res Psychol. 18(3):328–352. https://doi.org/10.1080/14780887.2020.1769238

Catarci M. 2021. Intercultural education and sustainable development: a crucial nexus for contribution to the 2030 agenda for sustainable development. Soc Sci. 10(1):24. https://doi.org/10.3390/socsci10010024

Cifuentes-Faura J, Faura-Martínez U, Lafuente-Lechuga M. 2020. Assessment of sustainable development in secondary school economics pupils according to gender. Sust. 12(13):5353. https://doi.org/10.3390/su12135353

Dale RG, Powell RB, Stern MJ, Garst BA. 2020. Influence of the natural setting on environmental education outcomes. Environmental Education Research. 26(5):613–631. https://doi.org/10.1080/13504622.2020.1738346

Dataloep. 2022. Vlaanderen is onderwijs en vorming. Leerlingenkenmerken secundair onderwijs. Retrieved (7/9/2023) from https://onderwijs.vlaanderen.be/nl/onderwijsstatistieken/dataloep-aan-de-slag-met-cijfers-over-onderwijs

Englert M, Girès J, Unger J, Yannart M. 2023. Welzijnsbarometer: Brussels rapport inzake armoede en sociale gezondheidsongelijkheden. Observatorium voor Gezondheid en Welzijn van Brussel-Hoofdstad - Vivalis.brussels.

European Commission: Directorate-General for Education, Youth, Sport and Culture, Mulvik I et al. 2024. Monitoring learning for sustainability: developing a cross-EU approach: final report. Publications Office of the European Union: Luxembourg. https://data.europa.eu/doi/10.2766/653214

European Commission. Joint Research Centre. 2022. GreenComp, the European sustainability competence framework. Publications Office.

Flick U. 2018. An introduction to qualitative research. 6th ed. Sage.

Förster R, Zimmermann AB, Mader C. 2019. Transformative teaching in higher education for sustainable development: facing the challenges. GAIA Ecological Perspectives for Science and Society. 28(3):324–326. https://doi org/10.14512/gaia.28.3.18

Gay G. 2002. Culturally responsive teaching in special education for ethnically diverse students: setting the stage. Int J Qual Stud Educ. 15(6):613–629. https://doi.org/10.1080/0951839022000014349

Giusti M, Mäkelä V, Garbett Skagerlid A, Nagatsu M. 2025. Shifting relationships with nature through schools: exploring the social and spatial context for transformative sustainability education. Ecol Soc. 30(2):34. https://doi.org/10.5751/ES-15969-300234

Hampton FM. 2016. The seven secrets of successful urban school pupils: the evidence continues to grow. Educ Urban Soc. 48(5):423–443. https://doi.org/10.1177/0013124514533990

Howari F, Qafisheh N, Nazzal Y. 2019. Environmental service-learning in the United Arab Emirates: is it mediated by the effects of biographical and demographical variables? Appl Environ Educ Commun. 18(4):300–312. https://doi.org/10.1080/1533015X.2018.1473820

Jacobs D, et al. 2025. Brussel maakt school? Uitdagingen voor het onderwijsveld in een autonomer brussel. In: Moors D, Vandenbroucke A, Degryse I, Boone S, editors. Brussel in een België met vier gewesten? Uitdagingen, kansen en vooruitzichten. Universitaire Pers Leuven. p 103–124. https://doi.org/10.2307/jj.20093322.10

Janssens R, Vaesen J. 2015. Chapter 11. In contact and/or in conflict? Ethno-cultural markers, language and schooling in post-war Brussels.

Jensen BB, Schnack K. 2006. The action competence approach in environmental education: reprinted from. Environmental Education Research (1997). 3(2):163–178.Environmental Education Research. 12(3-4):471–486. https://doi.org/10.1080/13504620600943053

Kowasch M, Lippe DF. 2019. Moral impasses in sustainability education? Empirical results from school geography in Austria and Germany. Environ Educ Res. 25(7):1066–1082. https://doi.org/10.1080/13504622.2018.1557112

Laine M. 2016. Culture in sustainability – defining cultural sustainability in education. Discourse and Communication for Sustainable Education. 7(2):52–67. https://doi.org/10.1515/dcse-2016-0016

Lang DJ, et al. 2012. Transdisciplinary research in sustainability science: practice, principles, and challenges. Sustainability Sci. 7(Suppl 1):25–43. https://doi.org/10.1007/s11625-011-0149-x
Lambrechts W, Van Liedekerke L, Van Petegem P. 2018. Higher education for sustainable development in flanders: balancing between normative and transformative approaches. Environ Educ Res. 24(9):1284–1300. https://doi.org/10.1080/13504622.2017.1378622
Lotz-Sisitka H, Wals AEJ, Kronlid D, McGarry D. 2015. Transformative, transgressive social learning: rethinking higher education pedagogy in times of systemic global dysfunction. Curr Opin Environ Sustain. 16:73–80. https://doi.org/10.1016/j.cosust.2015.07.018
Lusse M, Notten T, Engbersen G. 2019. School–family partnership procedures in urban secondary education, part A: strengths and limitations. School Commun J. 29(1):201–226.
Maréchal B, Bocquet C, Dassetto F. 2014. Musulmans et non musulmans à Bruxelles, entre tensions et ajustements réciproques. Fondation Roi Baudouin.
Miles MB, Huberman AM, Saldaña J. 2014. Qualitative data analysis: A methods sourcebook. 3rd ed. Sage.
Miles R. 2013. Experiencing sustainability education through place: a case-study from rural-regional Australia. J Sustain Educ. 5.
Milner HR, Iv, Murray IE, Farinde AA, Delale-O'Connor L. 2015. Outside of school matters: what we need to know in urban environments. Equity Excell Educ. 48(4):529–548. https://doi.org/10.1080/10665684.2015.1085798
Milner Iv HR, Lomotey K. 2021. Handbook of urban education. 2nd ed. Routledge. https://doi.org/10.4324/9780429331435
Pulinx R, Agirdag O, Van Avermaet P. 2014. Taal en onderwijs: precepties en praktijken in de klas. In: Clycq N, Timmerman C, Van Avermaet P, Wets J, Hermans P, editors. Oprit 14 : naar een schooltraject zonder snelheidsbeperkingen. Academia Press: Gent. p 97–133.
Rodríguez Aboytes JG, Barth M. 2020. Transformative learning in the field of sustainability: a systematic literature review (1999-2019). Int J Sustain Higher Educ. 21(5):993–1013. https://doi.org/10.1108/ijshe-05-2019-0168
Rickinson M. 2001. Learners and learning in environmental education: a critical review of the evidence. Environ Educ Res. 7(3):207–320. https://doi.org/10.1080/13504620120065230
Rissanen I. 2022. School–Muslim parent collabouration in Finland and Sweden: exploring the role of parental cultural capital. Scandinavian J Educ Res. 66(1):1–13. https://doi.org/10.1080/00313831.2020.1817775
Sacco M, Smits W, Spruyt B, Kavadias D, d'Andrimont. 2016. De brusselse jeugd: tussen diversiteit en kwetsbaarheid: BSI synthesenota. Brussels Studies. 98. https://doi.org/10.4000/brussels.1344
Saeys M. 2024. BRIO-fiche. http://www.briobrussel.be
Sass W, De Maeyer S, Boeve-de Pauw J, Van Petegem P. 2024. Effectiveness of education for sustainability: the importance of an action-oriented approach. Environl Educ Res. 30(4):479–498. https://doi.org/10.1080/13504622.2023.2229543
Scott W, Vare P. 2020. Learning, environment and sustainable development: A history of ideas. Routledge.
Sterling S. 2001. Sustainable education – re-visioning learning and change. In: Schumacher Briefing no6. Schumacher Society/Green Books: Dartington.
Stevenson RB. 2022. Approaches to education for sustainability. In: Noblit G, editor. Oxford Research Encyclopedia of Education. Oxford University Press. https://doi.org/10.1093/acrefore/9780190264093.013.93
Surmont J, Roebben K, Vaesen J, Brusselmans M, Verdoodt M. 2023. How to queer your (English) class. IGI Global. p 305–327.
Te Boveldt G, De Wilde L, Keseru I, Macharis C. 2023. Pedestrianisation as a step in a societal transformation? An analysis of support and opposition in Brussels. Cities. 143(2023):104577. https://doi.org/10.1016/j.cities.2023.104577
UNESCO. 2018. Issues and trends in education for sustainable development.
UNESCO. 2022. Berlin declaration on education for sustainable development. UNESCO.
United Nations Human Settlements Programme (UN-Habitat). 2020. Global State of Metropolis 2020 – Population Data Booklet. 2nd ed. UN-Habitat: Nairobi, Kenya. https://creativecommons.org/licenses/by/3.0/igo/
Urberg L, Öhman J. 2024. Resisting sustainable development: an analysis of young people's online discussions. J Youth Stud. 28:1–17. https://doi.org/10.1080/13676261.2024.2322607
Vandekerckhove B, et al. 2022. DeAtlas Superdiversiteit Vlaanderen -Toekomstverkenningen: Ruimtelijke verkenning van een superdiverse samenleving; uitgevoerd in opdracht van Departement omgeving.
Van den Branden K, Verhelst M. 2011. Naar een volwaardig talenbeleid. Vonk: Tijdschrift van de Vereniging voor Onderwijs in het Nederlands. 4(40):3–27.
Van Droogenbroeck F, et al. 2025. TALIS 2024 Vlaanderen. Vrije Universiteit Brussel.
Vare P, Scott W. 2007. Learning for a change: exploring the relationship between education and sustainable development. J Education Sustainable Develop. 1(2):191–198. https://doi.org/10.1177/097340820700100209
Vare P, Scott W. 2008. Education for sustainable development: Two sides and an edge. DEA Thinkpiece.
Vertovec S. 2007. Super-diversity and its implications. Ethn Racial Stud. 30(6):1024–1054. https://doi.org/10.1080/01419870701599465
Wals AEJ, Benavot A. 2017. Can we meet the sustainability challenges? The role of education and lifelong learning. European J Educ. 52(4):404–413. https://doi.org/10.1111/ejed.12273
Welsh RO, Swain WA. 2020. (Re)Defining urban education: a conceptual review and empirical exploration of the definition of urban education. Educational Res. 49(2):90–100. https://doi.org/10.3102/0013189X20902822
Wouters R, De Vydt M, Staes L. 2022. Truly Exceptional? Participants in the Belgian 2019 Youth for Climate Protest Wave. Politics of the Low Countries, 5 (Online First).

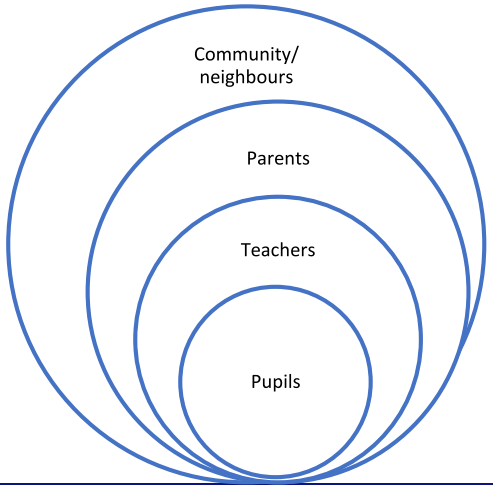
Yildiz NG. 2021. School counselors' leadership role in creating a collabourative school climate for linguistically diverse students. J Educ Learning. 10(6):7. https://doi.org/10.5539/jel.v10n6p7
Young J et al. 2024. Utilizing the urban education typology: a content analysis of selected citations. Urban Education. 60(2):600–627. (Original work published 2025). https://doi.org/10.1177/00420859241244749
Zulauf K, Wagner R. 2021. Urban and rural sustainability: divergent concepts and their consequences for marketing. Front Sustainability. 2:670866. https://doi.org/10.3389/frsus.2021.670866.
Zenasni S, Kuppens TE, Vaesen J, Surmont J, Stiers I. 2024. Conceptualizing education for sustainable development in urban secondary schools. Educ Urban Soc. 56(8):976–1001. https://doi.org/10.1177/00131245241238001

Appendices

Appendix A: interview protocols

Table A1. Interview protocol pupils.

Building Block/Concept	Guiding Questions
Retrospection	• What do you understand by sustainability? Write this on this pink post-it, stick it on this A3 • *Spontaneous:* Which of the 46 images do you think fit ESD and which do not? Write on this piece of paper on the left three numbers of the images that fit ESD, and on the right, three that do not. • *After images:* Now that you have seen certain images, do you now think of anything else about sustainability? Take a blue Post-it, write on it, and stick it back in the A3.
Building Block 2: Transformative learning approach	Statement: "I learned about sustainability thanks to school". • What and when? Explain that moment and give examples. How did you learn about this? How does the teacher address these lessons? Did you do anything with this after school?
Building Block 1: Pupils' sustainability competences + pupils' self-regulating skills + teachers' competence in ESD	Statement: "Because of what I learned; I now live more sustainably" • How did this make you think/live differently? What caused you to have that impact/How has that had an impact? • What can you do thanks to these lessons now? • What do you think influences your behaviour around sustainability? • Do you trust that you are talented enough to live sustainably or adapt your behaviour? • In this, did the teacher help you work with your confidence in a specific way?
Building Block 4: Whole-school approach	Statement: "Sustainability is a theme that lives at school". • In which subjects did you learn about sustainability? Is this theme *alive* at school? • How is this theme addressed at school? Is this limited to some subjects? Which ones?
Building Block 2 and 3: transformative learning approach + community engagement: people	Statement: "We only learn about sustainability inside the walls of the school; we never go outside". • What happens outside? In which lessons? • Are you allowed to take your initiative or encouraged to make suggestions or participate? Are you actively involved? • Is there collaboration with the neighbourhood or civil society organisations around sustainability themes? Around which theme? Do they come to school or do you go there? Do you do so outside?
Building Block 1: Teachers' competence in ESD	Statement: "Teachers are passionate about nature". • If yes: Can you give examples of moments where certain teachers paid attention to reflection around sustainability issues, where their passion for nature became clear, which inspired you, where their knowledge became clear, or where they collaborated with other teachers? Are these then only certain teachers or in certain subjects, or does everyone at school have the same vision on this? • If not: why do you think they are not passionate about it?
Building Block 3: Community engagement: people, pupils, parents, place (environment)	Statement: Who is involved in sustainability-related initiatives? • Examples? How?



(*Continued*)

Table A1. (*Continued*)

Building Block/Concept	Guiding Questions
	• Where and when? • Does this involve someone at school who facilitates communication with parents or others?
Building Block 1: Teachers' intercultural competence + culturally responsive learning approach + recognition of diversity	Statement: "Teachers take into account differences between pupils". • If yes: Do you feel teachers are knowledgeable about cultural differences between pupils? How do they take multiculturalism into account in the classroom? • If no: Do you feel sufficiently safe/free to share personal experiences/opinions? Is dialogue then engaged in? Are different perspectives addressed? In what form then? • Is this also the case during lessons on sustainability? • Are certain aspects taken into account at school such that certain pupils with a different home culture can feel supported or feel better at school?
Prospection	• What do you think sustainability should optimally look like at school? Side questions: • What would you like to do in the future? • What do you think is especially important? • Would you like to learn more about this? • How do you see a sustainable future? • Concerns about this? • More involvement with parents/neighbourhood?

Interview protocol used in focus groups with pupils ($n = 30$). Duration: 2×50 min; Pilot: 8/11/23; Ethical clearance: 26/9/23. Agreements: anonymity, respectful dialogue, audio recording, informed consent signed, socio-demographic questionnaire completed.

Table A2. Interview protocol teachers.

Building Block/Concept	Guiding Questions
Introduction	• What do you understand by sustainability? • What do you understand by sustainability education?
Building Block 4: Whole-school approach	• Is there a school-wide vision around this? • How is sustainability education worked on at school? • Sub-question: At your school, are there school-wide initiatives around sustainability (recurring actions)? Other learning activities?
Building Block 3: Community engagement: pupils	• In what ways are pupils involved in sustainability education at school?
Building Block 3: Community engagement: people	• Do you work with local external partners around sustainability issues? • Sub-questions: In what ways? Do these come to school? Are these civil society organisations?
Building Block 1: Pupils' sustainability competences	• What sustainability competences do pupils acquire at your school?
Building Block 1: Teachers' competence in ESD	• How do pupils acquire these? • Do you think their behaviour towards sustainability changes positively as a result?
Building Block 1: Pupils' self-regulating skills	• How do you work on pupils ' ownership of sustainable living?
Building Block 2: Transformative learning approach	• The ideal way to acquire sustainability competences and encourage positive behaviour is through a transformative learning approach. Are you familiar with transformative learning? • If yes: What do you mean by this? • If no: not merely conveying the knowledge (one-way teaching) but experiencing it in such a way that the learner starts to question their value framework (thoughts, feelings, beliefs, perspectives) and is emotionally drawn into the message, they make it their own and feel addressed (internalise and take it with them) e.g. recycling, merely saying it or demonstrating effective importance. Within this, concepts are important such as participation, constructive learning, reflection, critical, experience, and neighbproblem based. • Do you already teach in this way? If so: what teaching materials and work formats are used? • How do you evaluate these competences?
Building Block 3: Community engagement: place (environment)	• Do you have a connection with nature in your initiatives or during lessons on sustainability?
Building Block 4: Recognition of diversity	• Within sustainability education, it is important to create safe learning environments for all pupils. Many of your pupils come to school with a backpack that is completely different from the one at school. How does the school management integrate an intercultural school approach?
Building Block 1: Teachers' intercultural competence	• Do you take measures to take into account cultural diversity among learners in teaching for sustainability? • To what extent do you have the intercultural competence to take into account different perspectives of learners from diverse socio-economic and cultural backgrounds when teaching for sustainability?
Building Block 2: Culturally responsive learning approach	• Methods?
Building Block 3: Community engagement: Parents	• Are parents involved in achieving sustainability education? • Do you have a liaison figure who encourages and/or enhances contact between school and parents/pupils? • If yes: how do you experience this? • If not: would you find this desirable?
Prospection	• desirable policies? evaluation forms? Needs TL/CRE?

Interview protocol used in interviews with teachers ($n = 17$). Duration: 60-90min. Pilot: 20/12/23. Ethical clearance: 1/12/23. Agreements: anonymity, respectful dialogue, audio recording, informed consent signed.

Table A3. Interview protocol school leaders.

Building Block/Concept	Guiding Questions
Introduction	• What do you understand by sustainability? • What do you understand by sustainability education?
Building Block 1 and 4: Whole-school approach + Pupils' sustainability competences	• How is sustainability education worked on in schools? • Is there a written vision? If yes, what does the concrete plan of action consist of? If not, what are the recurring actions taken? Should you want one, what exactly should it contain? And who would you want to involve in it? • Where does the school position itself among Sterling (2001) categories (education 'about', 'for', or 'as' sustainable development)? • At your school, are there any school-wide initiatives around sustainability (everyone involved)? • Which learning activities already exist? How many and which teachers/ pupils are involved in your actions, and does this involve collaboration between teachers(teams) from different subject groups? • To what extent do you have a written vision (policy) around this? How does the management monitor whether or not all teachers are involved (vision)? • In what ways does the school leadership facilitate any teacher input/ commitment to certain sustainability practices? • Have you received a label or accreditation towards sustainability? If yes: What does it mean? If no: Have you received this for anything else?
Building Block 3: Community engagement: people	• Do you work with the city or civil society organisations on sustainability issues? • If yes: In what way (informing/consulting/cooperating/deciding/acting/ bottom-up)? Added value? At school or outside? Any barriers and obstacles? • If no: Do you have partnerships for anything else (subjects/projects/ themes)?
Building Block 3: Community engagement: pupils	• Do pupils get involved in your sustainability policies? Is the involvement about earlier information and consultation or is it also about deeper engagement (bottom-up)? • If so: in what way? Added value? Any barriers and obstacles? • If no: Are pupils involved in anything differently (subjects/projects/themes)?
Building Block 3: Community engagement: parents	• Are parents involved in achieving sustainability education? Is the involvement about earlier information and consultation or is it also about deeper involvement (bottom-up)? • If yes: In what way? Added value? Any barriers and obstacles? • If no: Are parents involved in anything differently (subjects/projects/ themes)? • Do you have a liaison figure that improves contact between school and parents? If yes: what function does this figure fulfil? Characteristics? If not: would you find this desirable? Should this be someone from the team or someone external?
Building Block 4: Community engagement: place (environment)	• Do you connect with nature in your initiatives or during lessons on sustainability? • If yes: How? • If no: please explain.
Building Block 1: Pupils' sustainability competences + Teachers' competence in ESD	• What competences does the school see as important in goals around sustainable development? How do pupils acquire these? • Have school-wide sustainability competences been defined? Contextualised to fields of study and/or urban environment? Is there a learning line around it?
Building Block 1: Pupils' self-regulating skills	• To what extent does the school work on pupils' ownership of leading a sustainable life? • To what extent does this increase pupils' commitment to sustainability?
Building Block 1 and 2: Transformative learning approach + Teachers' competence in ESD	• Are you familiar with transformative learning? If yes: What do you mean by this? If no: explanation. • Which learning materials and teaching methods are used? • To what extent do you have a policy on this that is supported by all teachers? • Is there a need for professionalisation among teachers where sustainability education is concerned? If yes: How does the school address this? If no: why not necessary?
Building Block 4: Recognition of diversity	• How does the school ensure pupils with different backgrounds feel at home and can develop? • How does the school leadership integrate a cross-cultural school approach/ connecting school climate?
Building Block 1: Teachers' intercultural competence	• To what extent do the teachers in your school have the intercultural competence to take into account different perspectives of pupils from diverse backgrounds when teaching for sustainability? • Does this competence apply to all teachers? • In what way do your teachers facilitate their teaching practice in this (e.g. professionalisation)?
Building Block 2: Culturally responsive learning approach	• Do teachers take measures to take into account cultural diversity among pupils in sustainability lessons?

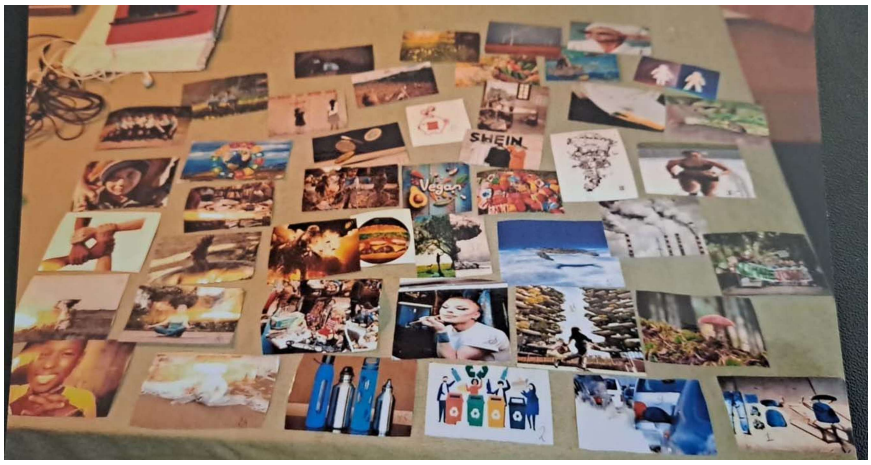
(*Continued*)

Table A3. (*Continued*)

Building Block/Concept	Guiding Questions
	• If yes: what forms of work do they use? • If no: in other lessons? • How is an open and safe classroom climate for discussing sustainability topics ensured?
Ending	• The interview concludes with recap questions, time for explanations, and thanks.

Interview protocol used in interviews with school leaders (n = 5). Duration: 60 min; Pilot: 17/11/23; Ethical clearance: 26/9/23. Agreements: anonymity, respectful dialogue, audio recording, informed consent signed, socio-demographic questionnaire completed.

Appendix B: picture of the photo-elicitation



Appendix C: schematic outlines

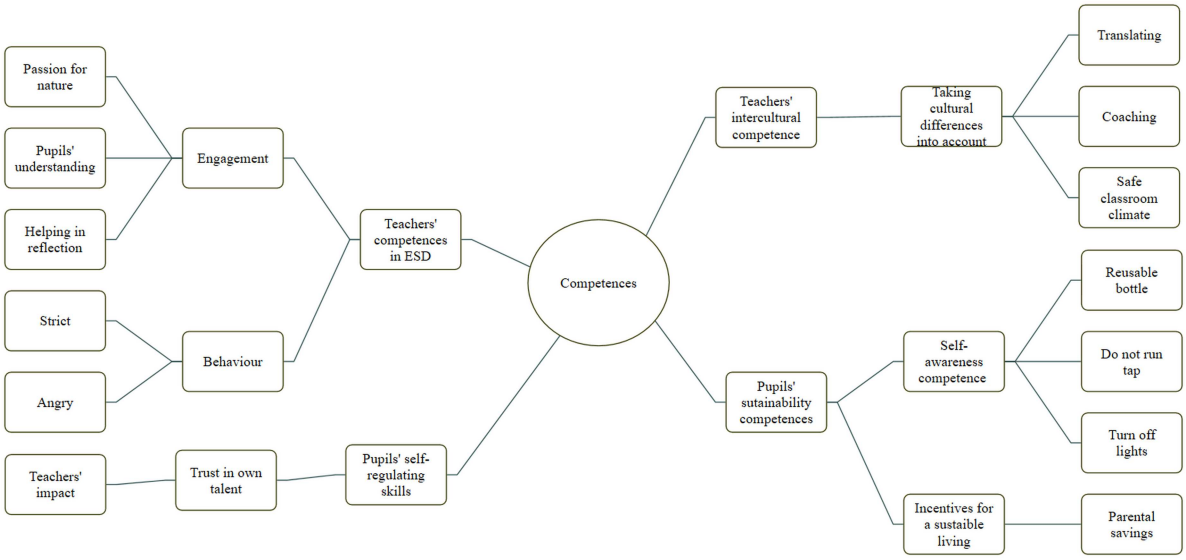


Figure C1. Schematic outline of one within-case analysis for the building block 'Competences' from the pupils' perspectives of School A.

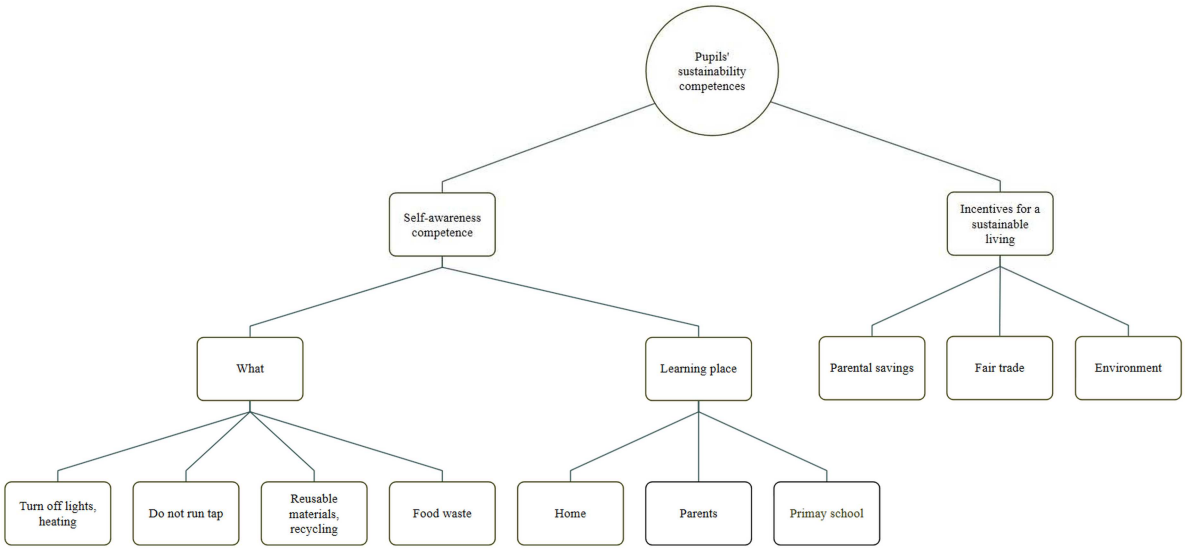


Figure C2. Schematic outline of one cross-case analysis for the building block 'Pupils' sustainability competences' from the pupils' perspectives.

Appendix D: table of illustrative quotes

Table D: Illustrative quotes of the building blocks: The first letter represents the respondent's role (Pupil, Teacher, School leader), the second letter indicates the school (A, B, C, D, E), and the number identifies the specific individual (1, 2, 3, etc.).

Characteristics of the building block: Competences	Illustrative quotes
(1)Pupils' sustainability competence	*"If I just see an eco-bin, I don't know what that is. We have loads of ponds, but I don't know what they do"* (PE7).
	"I think it's difficult, especially in the Brussels context, for a school to teach sustainability as a series of attitudes, to convey them, without a connection to what many boys prioritise, the street. As long as I don't have a picture of what those boys do on the street, I find it difficult to make that connection" (TC4).
	"Driving an expensive car and living in a villa with a lawn is still seen as the ideal dream, but it's not sustainable. Who should we educate? The pupils or the generation that perpetuated this goal? It's complex; I believe education should start with the teachers"(TB1).
	"They don't see that they are already engaging in sustainable practices within their lifestyles (TB1)".
	"Many children at our school live in precarious situations at home, and ecology is the last thing on their minds (TB2)".
(2)Pupils' self-regulating skills	*"I'm not sure yet if I'll do everything right"* (PB1).
	"… a long process of repeating until at some point there is a click" (TA3).
(3)Teacher competence in ESD	*"One teacher handles it more consciously or actively than others"* (SC1).
	"The teacher always gave lessons about nature, and we had to go outside, but I have forgotten everything" (PB3).
	"I do not live in a more sustainable way because of school" (PC3).
	"It's a small victory to move from intolerance to awareness, even if acceptance isn't achieved" (TC4).
	"The pupils are thinking too negatively. I think there are too few tools provided in schools to show how things can be done better or differently" (TB2).
	"Parents should not be traumatised when they go shopping" (TE1).
(4)Teachers' intercultural competence	*"When we don't have a class, for example, in the morning, this teacher comes to me, and we play basketball together"* (PB1).
	"During project week, Muslim pupils ask questions like, 'Can our swimsuits have sleeves?' We accommodate their needs, especially during Ramadan when they need to eat later" (TA3).
	"By banning headscarves, you keep a gate closed, which blocks a lot" (TB1).

(*Continued*)

Table D: (*Continued*)

Characteristics of the building block: Competences	Illustrative quotes
	"*I know nothing about Islam and those topics; I would like to learn more"* (TE1).
	"One time, I had a challenging conversation about homosexuality, and luckily, the Islamic religion teacher was passing by" (TC4).
Characteristics of the building block: Effective teaching strategies	**Illustrative quotes**
(5)Transformative learning approach	*"We see transformative learning differently. To us, it's more like a flex system where the pupils get to work, drive their learning, and also actually trial and error"* (SA1). *"I am not quite sure how to address sustainability within my subject"* (TE2). *"We went to a very big fair where all the machines were on display, but they gave us tasks all the time, from hall to hall, so we missed a lot of the fair"* (PA3). "*Nobody will say 'Can we go to a place to clean it?"* (PD4).
(6)Culturally responsive learning approach	*"I gave an extra lesson on homosexuality in the aristocracy to provide a counterbalance, using a role-playing exercise… I felt that I had to do it. Maybe they don't need to do that in another school"* (TE1). *"I think you have to give pupils enough say because it is for them that you teach that lesson"* (TA2). *"I would also find it a shame if, in the sustainability debate, we don't start from their circular context - that we don't take their environment as a starting point and encourage their way of life, i.e. the sharing economy—and that's not necessarily the case in wealthier schools"* (TD2).
Characteristics of the building block: Community engagement	**Illustrative quotes**
(7)Broader community	*"I actually do not know much about that" (TD4).* *"There is never any collaboration with the neighbourhood" (PE6).*
(8)Engagement of pupils	*"We are not motivated to take initiatives ourselves"* (PB3) *"The pupils are not structurally involved in that"* (TD3).
(9)Engagement of parents	*"I think we can only dream of this" (SA1).* *"There is little contact with parents" (TC3).*
(10)Place-based education	*"We always have lessons in the classroom"* (PC4). *"We are so deeply embedded in an urban context that it is very difficult to incorporate that"* (TB2). *"At the end of the year, we were allowed to go outside because we had finished learning, but that was because the teacher decided it, not us"* (PE6).
Characteristics of the building block: School culture	**Illustrative quotes**
(11)Whole-school approach	"*It's 'alive' at school, but we've never learned about it*" (PE6). *"At the school level, there is a request for showing respect for things, and that every teacher acts as a good caretaker in terms of drawing attention to small matters. But the message does not come across clearly to the pupils"* (TD4). *"What bothers me to some extent is that it often consists of isolated occurrences within a classroom. There's still too little of a coherent curriculum… I would like to have some guidelines to further support the implementation of ESD" (SE1).* *"We took the train to Berlin last year, but the major issue was that the cost has become prohibitively high… If the train were as affordable as the plane, then, of course, we would take the train"* (SB1).
(12)Intercultural school culture: recognition of diversity	*"I'm not sure if, when it comes to sustainability, we incorporate that intercultural approach"* (SE1). *"Since many young people do not receive enough healthy food from home, ..., the soup will also be available"* (SD1). *"I always start in Dutch, because that's the correct procedure. If it doesn't work, then I switch to French or English, … And why not use all the languages of the rainbow to make our school message clear?"* (SD1). *"We ensure that our pupils experience one to two cultural activities because if they don't experience them now, they may never experience them… we continue to invest in bringing culture to the pupils, that is also sustainable"* (SC1). *"The fact that Mayssa can speak Arabic, is an asset that we notice with the parents. They are not illiterate, but they still have a hard time understanding"* (SE1). "*I recruited Iyad and Lilya based on that intercultural competence. So, I ensure that my staff reflects Brussels, right?"* (SD1).