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Enhancing education through learning for sustainability: an explorative review of broader benefits

Executive summary



Education and
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Enhancing education through learning for sustainability: an explorative review of broader benefits

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Aims

Learning for sustainability (LfS) encompasses holistic, interdisciplinary experiences that equip learners with essential sustainability competences (European Commission, 2024). The 2018 Council Recommendation on key competences for lifelong learning emphasises improving, among others, basic skills (such as literacy and numeracy), competences in STEM, and digital competences, while fostering citizenship and appreciating cultural diversity. This study aims to explore how LfS contributes to those broader learning outcomes, particularly in (pre-)primary and secondary education.

Methodology

A literature review was conducted to provide timely evidence for policymaking. The primary databases used were ERIC, the Web of Science and Scopus, with a focus on peer-reviewed studies published between 2015 and 2024 focusing on (pre-)primary and secondary education. Documents were screened in multiple stages, and snowballing techniques were used to complement the selection. No distinctions were made between urban or rural schools, or between public and private institutions. Details regarding the methodology used, including search terms and selection criteria, can be found in Appendix to this report.

Results

The present report reveals some broader learning benefits of LfS. These can be classified into basic skills, transversal skills, psychological benefits, and institutional benefits. Many studies have reported these benefits within the context of outdoor, nature-based learning for sustainability settings.

Impact of LfS on basic skills

Although the number of studies identified is relatively small, LfS appears to enhance basic academic skills by integrating real-world sustainability contexts into education. For example, cross-curricular approaches can enhance basic skills such as numeracy, while experiential learning can boost typical STEM skills. Moreover, nature-based learning can improve students' connection to their environment, fostering academic success. An inclusive approach to LfS can also support the participation of minority groups and students with special needs, offering broad educational and developmental benefits.

Impact of LfS on transversal skills

Learning for sustainability can affect the development of transversal skills that are essential for navigating today's complex world. For instance, it can foster higher-order thinking skills, thereby equipping students for a complex and uncertain future. In addition, LfS can also promote citizenship by encouraging civic engagement and social responsibility. This, in turn, enhances students' understanding of local and global challenges. Furthermore, while research into LfS and employability is still emerging, it shows promising results in developing entrepreneurial skills, especially through hands-on, cross-curricular projects. In addition, LfS can also enhance adaptability and resilience.

Psychological benefits of LfS

Learning for sustainability can provide psychological benefits for students, particularly through nature-based experiences. Exposure to natural environments enhances physical and emotional well-being, fostering healthier development. Nature-based LfS is linked to increased motivation, improved behaviour, and better academic performance. This is due

to the fact that students are exposed to calm, engaging learning environments that promote attention and self-discipline. In addition, outdoor activities improve physical health, reduce stress, and enhance self-esteem, leading to greater overall well-being. For younger students, exposure to nature supports holistic child development, encouraging socio-emotional growth and the development of interpersonal skills and a deeper connection to the environment.

Institutional benefits of LfS

Learning for sustainability can positively transform school culture by fostering collaboration among students, teachers and the community – particularly in urban settings, where diversity and socio-emotional needs are critical for educational equity. Through a whole-school approach, sustainability is integrated into all aspects of school operations, thereby promoting a more inclusive and participatory learning environment. Furthermore, teachers' competence in LfS is essential to this success, whereby proximity to green spaces enhances teachers' attitudes towards LfS.

Policy recommendations

Learning for sustainability should be prioritised as a vital component of quality education, potentially enhancing students' basic and transversal skills while promoting psychological well-being. Schools should be encouraged to adopt a whole-school approach to integrating LfS into curricula and teaching, fostering collaboration among primary and secondary school students, teachers and the community. This requires increased support and investment to overcome implementation challenges:

- Professional development: invest in teacher training to equip teachers with the competences needed for the effective integration of LfS.
- Cross-curricular programmes: promote cross-curricular instruction or projects to enhance LfS practice, while simultaneously improving basic skills such as numeracy.
- Nature-based and outdoor learning: integrate nature-based learning to foster environmental literacy and support health and well-being, especially for disadvantaged students.
- Experiential learning: emphasise experiential and place-based education through community partnerships to address real-life challenges.

Recommendations for future research

So far, the impact of LfS on broader learning outcomes remains underexplored. In particular, research on the impact of LfS on numeracy and mathematical proficiency is very scarce. Moreover, most of the research found is of a rather explorative character, which makes it difficult to derive strong conclusions about LfS as a means to guarantee quality education. To strengthen the case for LfS, researchers are encouraged to replicate previous studies in order to validate earlier, positive findings, and to prioritise longitudinal research to capture the long-term impacts of LfS:

- Inclusivity in research: future studies should include low-income groups and minorities to ensure equal opportunities in sustainability initiatives.
- Assessment tools: tailored assessment tools should be developed to evaluate student progress within LfS, focusing on long-term outcomes.
- Literacy and numeracy outcomes: refined methods should be used to better evaluate the impact of LfS on literacy and numeracy, and reliable progress indicators should be investigated.
- Well-being and employability: further research is needed on the impacts of LfS on well-being in secondary education and on employability, along with support for teachers across different contexts.

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