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How to Integrate ESD (Education for Sustainable Development) into STEM Education?: A Systematic Literature Review

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ABSTRACT
Education plays a crucial role in achieving the Sustainable Development Goals (SDGs). Each SDG relies on education to equip individuals with the knowledge, skills, abilities, and values necessary for personal development and societal contribution. This gave rise to the concept of education for sustainable development (ESD). Within this framework, STEM (science, technology, engineering, and mathematics) education is vital for preparing the younger generation to tackle societal challenges. Integrating ESD principles into STEM education is thus an effective approach to promote a sustainable future. This study aims to review existing empirical research on the implementation of STEM-ESD to explore various strategies for STEM-ESD learning. The PRISMA 2020 systematic literature review method was used, with Scopus as the primary database. Out of 160 collected articles, 20 met the criteria for thematic-qualitative analysis. This study finds that the strategies to integrate ESD into STEM education are: 1) Incorporating concepts of SDGs into STEM lessons, 2) Promoting hands-on activities and projects, 3) Designing real-world problems to apply STEM in addressing sustainability challenges, 4) Fostering partnerships with local communities, organizations, and industry stakeholders, and 5) Providing training and resources for educators to enhance their understanding of STEM-ESD teaching.

Keywords: *STEM education, Education for Sustainable Development, STEM-ESD, systematic literature review*

INTRODUCTION

One common viewpoint mentions that the actions of the present generation significantly impact the lives of future generations. Hence, while addressing the needs of today, it's essential to also prioritize the sustainability of life for generations to come (Wahono & Chang, 2019). Education plays an important role in this position. Education is widely acknowledged as a pivotal component of sustainable development, as emphasized by Dannenberg and Grapentin (2016) and Del Cerro and Lozano (2018). According to UNECED (1992), education plays a crucial role in promoting sustainable development and enhancing people's capacity to address environmental and developmental challenges, leading to the emergence of the concept of Education for Sustainable Development (ESD).

ESD, as defined by Wals and Kieft (2003), embodies a vision of education that strives to balance human and economic well-being with cultural traditions while respecting the Earth's natural resources. It aims to equip students with essential competencies to navigate the present actively, make informed decisions, and contribute to society's sustainable development in the future, as highlighted by Abdullah et al. (2018), Heiskanen et al. (2016), and Chan et al. (2009). Leicht et al. (2018) further elaborate that ESD seeks to empower present and future generations to address their needs using a comprehensive approach encompassing economic, social, and environmental dimensions. In essence, ESD enables students to comprehend real-world changes, anticipate future scenarios, recognize present and future societal challenges, and collaboratively devise solutions. As Bellanca (2010) and Trilling & Fadel (2009) suggest, students must not only acquire knowledge but also learn to apply it to identify and solve problems, fostering cooperation among humanity, society, and nature.

All educational domains and levels are entrusted with contributing to ESD, including STEM education, as highlighted by Burmeister & Eilks (2013). STEM education is instrumental in nurturing students' creativity, interdisciplinary thinking skills, and understanding of sustainable development, vital competencies for their future, as noted by Baran & Maskan (2010). It involves an interdisciplinary curriculum that integrates various subjects into each lesson. For instance, even in a mathematics class, teachers can adopt an interdisciplinary approach, prompting students to address real-world challenges like poverty and pollution using mathematical algorithms for data analysis (Suh & Han, 2019).

Therefore, ensuring the sustainability of STEM education is paramount for the upcoming generation. Pahnke et al. (2019) underscored the nexus between STEM and sustainability, asserting that STEM disciplines are pivotal in engaging in the collective endeavor of seeking, learning, and shaping solutions to global sustainability challenges. Echoing this sentiment, Dotson et al. (2010) proposed that access to quality STEM education correlates with decreased poverty, heightened economic growth, and more resilient democracies, with these disciplines playing a fundamental role in addressing numerous Sustainable Development Goals (SDGs). This integration of STEM and ESD is termed STEM-ESD learning.

Pahnke et al. (2019) contended that STEM-ESD fosters independent thinking and responsible action within the students' context, encompassing both social and natural environments. It offers the opportunity to effect tangible changes within the student community, albeit on a modest scale, thereby bolstering their capacity for agency. Implicit in this is a sense of responsibility inherent in each action and decision made by individuals. By advocating for responsible action through STEM-ESD, the autonomous thought process involving students and their environment indicates the likelihood of genuine changes manifesting in students' activities and behaviors towards their surroundings. STEM-ESD learning facilitates the development of skills enabling students to establish connections between their personal and local environments and their personal and global spheres (Gavari-Starkie et al., 2022).

Hence, educators play a pivotal role within the educational framework (Suh & Han, 2019; Tanang & Abu, 2014). Within classrooms, teachers wield influence in fostering values and attitudes conducive to achieving Sustainable Development Goals (SDGs) (Del Cerro & Lozano, 2018), necessitating the incorporation of innovative strategies into their teaching methodologies. Through an exploration of extant empirical research, this study aims to provide a detailed examination of methods for integrating ESD concepts into STEM education. In pursuit of this objective, the research poses the following question: How can ESD concepts be effectively integrated into STEM education? To comprehensively grasp the strategies inherent in this pedagogical approach, a thorough analysis of existing empirical research is imperative.

As only a portion of the gathered articles qualify for thematic qualitative analysis, it is essential to delineate the current knowledge base and pinpoint areas that require further investigation in merging STEM-ESD. Through a deeper comprehension of the methods for incorporating ESD into STEM education, we can formulate more effective educational approaches to prepare forthcoming generations for addressing intricate global challenges and promoting sustainable development. This study significantly contributes to filling this informational void by conducting a systematic literature review of existing research on the implementation of STEM-ESD in educational settings.

METHODOLOGY

The study utilized a Systematic Literature Review following the PRISMA 2020 guidelines (Page et al., 2021) to examine prior research and gather information regarding the implementation of STEM-ESD learning. The search was conducted on 12 August 2023, utilizing Scopus as the primary database. Scopus was chosen for its credibility, provision of high-quality information, ease of data retrieval, and relevance to the study's focus.

Various keywords were employed for the searches, including (1) STEM Education; (2) Education for Sustainable Development; and (3) STEM-ESD. The initial search yielded 648 articles. Subsequently, articles were screened based on their titles, abstracts, and full-text content against the criteria outlined in Table 1.

Table 1. Eligibility Criteria

No	Inclusion Criteria	Exclusion Criteria
1	Article published between 2019 and 2023	Published before 2019
2	Text in the form of journal articles or proceedings	The title is not in English
3	Journal indexed by Scopus (Q1-Q4) or Sinta (S1-S2)	The article or proceeding is not empirical research
4	Related to STEM-ESD research	Not related to STEM-ESD research

To ensure a structured selection process, the researcher utilized Microsoft Excel to facilitate data coding, sorting, and analysis. Out of 648 articles, 628 were eliminated because they did not meet the predetermined criteria. The detailed procedure of the selection process is illustrated in Figure 1.

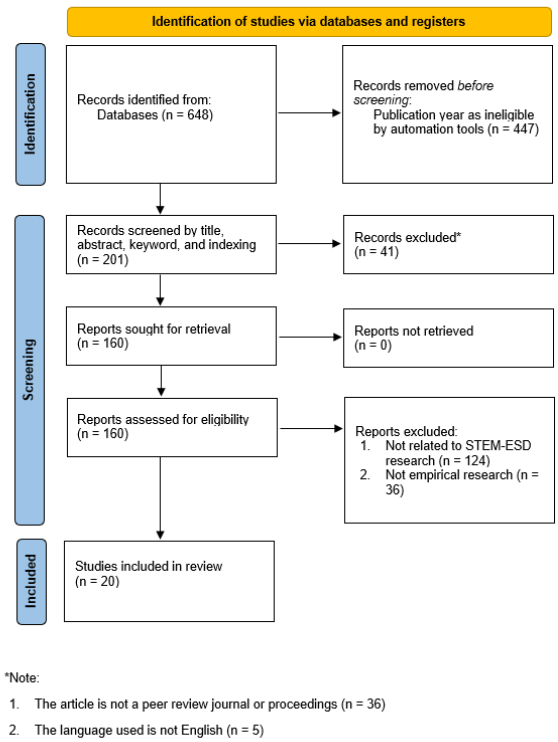

Image 1. Article selection flow diagram

The selection process yielded 20 articles that satisfied the criteria. The analysis of these articles followed a meta-synthesis approach, comprising several stages: (1) identifying the research focus; (2) identifying relevant research; (3) selecting research that meets the review criteria; (4) assessing the selected research; (5) extracting data from the research; and (6) synthesizing the data. This method aligns with the methodology advocated by Evans & Pearson (2001). The choice of this approach is not only because it offers a structured framework for conducting the research but also because it aligns with the primary objective of the study, which is to examine and consolidate various prior studies concerning STEM-ESD education. This will yield comprehensive insights into the strategies for integrating ESD into STEM education.

RESULT AND DISCUSSION

Teachers are pivotal in reshaping the education system to prioritize sustainability. Combining STEM with ESD represents a significant stride toward realizing the essential shifts for transformative education aligned with sustainable development goals (Rico et al., 2021). Therefore, educators need the skills to seamlessly incorporate ESD into STEM instruction. The strategies to integrate ESD into STEM Education can be seen in the following Table 2.

Table 2. The strategies to integrate ESD into STEM (authors' own elaboration based on the literature)

No	Author	Strategies
1.	(Abdurrahman et al., 2023; Costa et al., 2023; Del Cerro Velázquez & Rivas, 2020; Fakhrudin et al., 2021; Gamage et al., 2022; Gavari-Starkie et al., 2022; Khadri, 2022; Nguyen et al., 2020; Nguyen, 2023; Rico et al., 2021; Rustaman, 2021; Wahono & Chang, 2019)	Incorporating concepts of SDGs into STEM lessons
2.	(Abdurrahman et al., 2023; AlAli et al., 2023; Costa et al., 2023; Fakhrudin et al., 2021; Khadri, 2022; Nguyen et al., 2020; Nguyen, 2023; Rico et al., 2021; Rustaman, 2021; Suh & Han, 2019; Ulmeanu et al., 2021; Wahono & Chang, 2019)	Designing real-world problems to apply STEM in addressing sustainability challenges
3.	(Abdurrahman et al., 2023; AlAli et al., 2023; Batchelder et al., 2023; Campbell & Speldewinde, 2022; Costa et al., 2023; Del Cerro Velázquez & Rivas, 2020; Nguyen, 2023; Nguyen et al., 2020; Suh & Han, 2019; Vilmala et al., 2022; Wahono & Chang, 2019)	Promoting hands-on activities and projects
4.	(Abdurrahman et al., 2023; AlAli et al., 2023; Batchelder et al., 2023; Gavari-Starkie et al., 2022; Khadri, 2022; Martín-Sánchez et al., 2022; Wahono & Chang, 2019)	Fostering partnerships with local communities, organizations, and industry stakeholders
5.	(Abdurrahman et al., 2023; Del Cerro Velázquez & Rivas, 2020; Fakhrudin et al., 2021; Gavari-Starkie et al., 2022; Nguyen et al., 2020; Stouthart et al., 2023; Vilmala et al., 2022)	Providing training and resources for educators to enhance their understanding of STEM-ESD teaching

Incorporating concepts of SDGs into STEM lessons

To integrate Education for Sustainable Development (ESD) in STEM education, teachers can incorporate concepts of sustainability and Sustainable Development Goals (SDGs) into STEM lessons. The SDGs towards UNESCO consist seventeen goals, which are: 1) no poverty, 2) zero hunger, 3) good health and well-being, 4) quality education, 5) gender equality, 6) clean water and sanitation, 7) affordable and clean energy, 8) decent work and economic growth, 9) industry, innovation and infrastructure, 10) reduced inequalities, 11) sustainable cities and communities, 12) responsible consumption and production, 13) climate action, 14) life below water, 15) life on land, 16) peace, justice and strong institutions, and 17) partnerships for the goals. From those seventeen goals, teachers have to choose topics which is compatible with the goals of sustainable development (Campbell & Speldewinde, 2022).

The research conducted by AlAli et al., (2023) indicated that employing the STEM approach in teaching holds promise for addressing all the sustainable development goals in education. The study's results suggest that this method is capable of addressing all seventeen goals, underscoring the benefits and advantages of STEM-based instruction as outlined in educational literature. These benefits encompass fostering creative and systemic thinking, enhancing comprehension, and its economic relevance in addressing present and future challenges, thereby contributing to environmental enhancement and development, which aligns with the objectives of sustainable learning.

By integrating STEM fields with technology and mathematics, all science disciplines can address and discuss sustainable development within their domains, thereby enhancing students' understanding of their roles in attaining the SDGs (Martín-Sánchez et al., 2022). Thus, teachers must foster interdisciplinary cooperation among STEM subjects and sustainability principles. For instance, they can incorporate environmental science into biology lessons, renewable energy into physics, or sustainable design into engineering projects (Wahono & Chang, 2019), exploring agro-ecological systems and integrating biology education with other scientific disciplines like chemistry and physics can contribute to achieving SDGs 1, 2, 14, and 15. Similarly, chemistry education can aid in achieving SDGs 3, 6, 12, 14, and 15 by enhancing students' comprehension of physio-chemical properties and their implications for the environment and human health.

Furthermore, leveraging ESD guide issued by UNESCO can assist educators in integrating specific learning objectives and essential competencies for sustainability into their curriculum. It is also crucial for teachers to adopt sustainable perspectives and involve students in sustainable projects to foster awareness and instill a sense of sustainability consciousness (Del Cerro Velázquez & Rivas, 2020). Embedding concepts of the Sustainable Development Goals (SDGs) into STEM education can facilitate the development of an interdisciplinary STEM curriculum centered on sustainable development (Gavari-Starkie et al., 2022). This approach can deepen students' comprehension of the significance of sustainability and inspire them to engage in actions toward building a more sustainable future (Rico et al., 2021; Ulmeanu et al., 2021), and help students recognize the relevance of science in their daily lives and viewing themselves as catalysts for change in achieving the SDGs (Burbules et al, 2020).

Promoting hands-on activities and projects

It is essential to promote hands-on activities and projects that focus on sustainable solutions in implementing STEM-ESD learning. Incorporating SDGs into STEM education not only enables students to explore sustainable solutions using their STEM skills (AlAli et al., 2023) but also empowers them to participate in authentic tasks, conduct research, and devise solutions to real-world issues (Nguyen et al., 2020; Suh & Han, 2019). These strategies aid students in nurturing their creativity and fostering innovative mindsets, which are crucial for tackling present and future development challenges (Nguyen et al., 2020)

Encouraging hands-on activities, particularly those focused on students designing products or objects, serves as a valuable approach for fostering their scientific comprehension and problem-solving abilities (Fortus et al., 2004). This method is recognized as a promising instructional technique for enriching students' engagement with and understanding of science (Apedoe et al., 2008). Moreover, it promotes interactive, learner-centered teaching that facilitates exploratory, action-oriented, reflective, and transformative learning experiences (Campbell & Speldewinde, 2022).

Based on previous research, teachers often design projects that align with the Sustainable Development Goals (SDGs), addressing both local and global issues such as sustainable consumption and production, water quality and availability, energy sustainability, and sustainable agriculture and food production (Nguyen et al., 2020). For instance, some projects aim to teach students how to create simple sustainable daily use objects or products using recycled materials and manage waste effectively. Other examples include projects focused on food safety and security, water treatment and conservation, and renewable energy. These projects also incorporate lessons on health protection and education, flood prediction, drought mitigation, and agri-environmental protection. Overall, the majority of projects are structured around real-world issues and phenomena, serving as the foundation for the educational objectives, while only a few projects center solely on scientific experimentation and inquiry (Nguyen et al., 2020).

Engaging students in projects and hands-on activities fosters a sense of participation in their learning. When teachers offer opportunities for children to actively engage, allowing them to control the inputs and outcomes of their learning, students can deepen their understanding of key sustainability concepts by drawing on their STEM skills and the scientific process. This active involvement empowers students to take reasoned actions within their learning environment (Pahnke et al., 2019). By valuing each student's contribution and seeking their input, teachers cultivate an environment of mutual respect. Students come to recognize the significance of their contributions to the group and how their involvement can impact outcomes (Campbell & Speldewinde, 2022).

To support the activities consisted hands on and projects based STEM-ESD learning, it can be applied with problem-based learning (Gamage et al., 2022; Nguyen, 2023; Ulmeanu et al., 2021) and project-based learning (Abdurrahman et al., 2023; AlAli et al., 2023; Fakhrudin et al., 2021; Gamage et al., 2022; Nguyen et al., 2020; Suh & Han, 2019; Wahono & Chang, 2019) which are utilized to scientifically investigate natural phenomena or problems and introduce new concepts to students during the teaching-learning process. These methods specifically cater to students' curiosity and inclination for exploration, encouraging them to inquire, ask questions, and seek answers to current issues with understanding. Based on constructivist learning theories, problem-based learning and project-based learning have been extensively employed in STEM-ESD, offering opportunities for hands-on exploration, experimentation, questioning, and reasoned responses. In addition to problem-solving, students gain a deeper comprehension of natural phenomena ("minds on") through thorough investigations, such as engaging in projects and hands-on activities akin to how scientists work (Gamage et al., 2022), so that they can tackle real-world sustainability challenges, urging them to apply their STEM knowledge to devise sustainable solutions in practical contexts (Fakhrudin et al., 2021).

Designing real-world problems to apply STEM in addressing sustainability challenges

One of the characteristics of STEM education is that most classes are centered on addressing real-world problems, aligning well with ESD goal of empowering current and future generations to address their needs using a balanced approach to economic, social, and environmental challenges (Suh & Han, 2019). STEM education can be structured to emphasize real-world issues related to sustainable development (Nguyen et al., 2020). These real-world explorations involve authentic investigations with complex objectives, offering opportunities for problem-solving while incorporating students' beliefs and values (Redman, 2013). According to Brundiers et al. (2010), real-world learning helps students deepen their understanding of sustainability issues (knowledge) and enhances their ability to apply problem-solving methods (strategic competence). It also provides hands-on experience in connecting knowledge with action for sustainability (practical competence). Students learn to create sustainability strategies and programs within the context of existing processes, politics, or traditions. Additionally, real-world learning opportunities enable students to recognize and participate in various forms of collaboration with varying levels of intensity (collaborative competence). By assigning tasks focused on real sustainability challenges, teachers can engage students and guide institutions towards more sustainable behaviors and policies. This approach allows students to apply theoretical knowledge in practice and develop interpersonal skills essential for engaging with stakeholders, both crucial for sustainability (Redman, 2013).

Four methods to provide real-world learning experiences to students are: (1) integrating real-world scenarios into classrooms, (2) taking students on field trips to observe real-world settings, (3) using simulations to replicate real-world conditions, and (4) involving students in direct engagement with real-world activities (Brundiers et al., 2010). These approaches can help students grasp the significance of sustainable development while applying STEM concepts (AlAli et al., 2023). For example, teachers can incorporate global sustainability issues, such as climate change, biodiversity loss, and resource management, into STEM lessons. Students can then design and construct eco-friendly buildings, create water filtration systems, or develop renewable energy solutions as part of their learning activities (Wahono & Chang, 2019). This enables students to see the practical applications of STEM concepts in tackling environmental, social, and economic challenges globally (Rustaman, 2021; Suh & Han, 2019; Wahono & Chang, 2019).

Previous research demonstrates that educational approaches grounded in real-world contexts help students recognize the relevance of science in their daily lives, increasing their interest and enjoyment in addressing real-life situations (Bennett & Holman, 2003; George & Lubben, 2002; Pedretti & Hodson, 1995). Real-world context-based teaching and learning suggest that everyday situations familiar to learners can be investigated and that STEM-ESD learning related to these problems can be explored to explain these situations (Lubben et al., 1996). Furthermore, this approach can encourage students to work in teams on projects addressing real-world sustainability challenges, fostering collaboration, critical thinking, and problem-solving skills, which are essential for sustainability competencies (AlAli et al., 2023).

Research by Remington-Doucette (2013) demonstrated the impact of incorporating real-world problems into education by evaluating a course focused on sustainability through case studies. These case studies required students to address complex real-world issues, leading to significant increases in their sustainability competencies. The findings indicated that Education for Sustainable Development (ESD) is effective when instructors integrate real-world contexts relevant to students' daily lives. Additionally, research by George and Lubben (2002), Gutwill-Wise (2001), and King and Henderson (2018) has shown that students' interest in science grows when teaching approaches are based on real-world situations. When students can connect the real-life context with the concepts they are learning, they become more engaged and interested, seeing the relevance of their education to their everyday lives. This type of learning and reasoning can also positively influence students' behavior towards their environment.

Fostering partnerships with local communities, organizations, or experts in sustainability

Given the above, it is crucial to incorporate real-world experiences into the STEM-ESD learning process. To achieve this, students should engage in activities that foster connections with their community (Castro et al., 2020). Collaborating with local communities, organizations, or sustainability experts can offer students real-world experiences and mentorship opportunities (Wahono & Chang, 2019). Settings in communities and organizations in sustainability let students expose to real-world experiences and have a common focus on contextual problems (Gamage et al., 2022). This approach is effective in delivering sustainability education, as it helps students develop key sustainability competencies (Brundiers et al., 2010).

Several studies emphasize the significance of sharing knowledge with external stakeholders (Lai et al., 2015) to provide innovative solutions for profound changes in environmental, social, or economic systems (Van Tulder et al., 2016). By aligning diverse backgrounds, values, ideas, and resources, partnerships can effectively address complex societal issues, such as the UN Global Goals (Van Tulder & Keen, 2018). One key outcome of collaboration and partnership is the ability to transfer knowledge and facilitate learning among different stakeholders (Décamps et al., 2021). Building partnerships with multiple stakeholders has been widely recognized as a critical factor in fostering knowledge and innovation (Moon et al., 2019).

Integrating partnerships into STEM-ESD classrooms can take various forms, such as guest lectures, workshops, field trips, or internships related to sustainable practices. Organizing field trips to sustainable facilities or inviting guest speakers from sustainable industries offers practical insights into the application of STEM principles in sustainable development (AlAli et al., 2023). These experiences allow students to engage in real, active, and in-depth actions to promote sustainable development. Additionally, involving students in community service has been shown to enhance learning retention and motivation towards school activities (Martín-Sánchez et al., 2022).

Fostering partnerships with experts and the community in sustainability connects students' knowledge and skills with service to others, aligning theoretical aspects, talent, and creativity towards social commitment. This approach allows students to acquire knowledge and practice their skills while contributing to improving their reality (Martín-Sánchez et al., 2022). Through these activities, students see firsthand how sustainable practices are implemented in various industries. For example, students can visit solar power plants, wind farms, water treatment facilities, organic farms, or green buildings. Being on-site enables students to engage with the environment and technology, enhancing their learning through observation and interaction. They can witness the operation of renewable energy systems, waste management processes, and sustainable agricultural practices.

Inviting sustainability experts into classrooms or organizing field trips can make learning more dynamic and contextually relevant. These experiences help students connect classroom theory with practical applications, fostering a deeper understanding of sustainable development. They also provide a platform for interdisciplinary learning, as sustainability often requires knowledge across various STEM fields. Connecting students to their community has proven to engage and motivate them more effectively in the learning process (Holmens et al., 2022). This approach offers students opportunities to participate in sustainability projects and apply STEM skills in real-life scenarios (Abdurrahman et al., 2023; Khadri, 2022), providing a holistic understanding of sustainability (AlAli et al., 2023).

Providing training and resources for educators to enhance their understanding of STEM-ESD teaching

Redman (2013) emphasized the crucial integration of educational pedagogy, behavioral change, and sustainability competencies to foster sustainability and enact lasting change. This underscores the pivotal role of pedagogical methods in sustainability-centered education (Gamage et al., 2022). Therefore, teachers are key contributors to STEM-ESD education, requiring adequate training and resources to seamlessly incorporate ESD into STEM teaching. This could entail targeted professional development covering sustainability principles, teaching techniques, and practical applications through real-life instances (Nguyen et al., 2020).

Offering professional development initiatives for educators to deepen their grasp of ESD and its fusion with STEM education is vital (Fakhrudin et al., 2021). Through teacher training, they can refine their skills in devising and executing instructional methods, choosing suitable materials, and assessing teaching methodologies to seamlessly blend (Stouthart et al., 2023).

The primary aim of the program is to advance the teaching of STEM coupled with ESD principles. This initiative can also stimulate interdisciplinary collaboration, exchange of ideas, and innovative teaching methodologies among educators in the STEM-ESD domain. The program is designed to equip school administrators, educational policymakers, and practitioners with professional development in STEM concepts, integration strategies, teaching approaches, and the developmental role of STEM education. Furthermore, it encourages educators to collaborate with peers in developing STEM-ESD teaching projects and topics, fostering experimentation with STEM-ESD teaching methodologies within their schools (Nguyen et al., 2020). Through provision of training and resources, educators can adeptly fuse ESD into STEM education, nurturing a comprehensive comprehension of sustainability challenges and empowering students to drive positive change in their communities and globally.

CONCLUSION

Undoubtedly, integrating ESD into school curricula is of utmost importance. STEM education emerges as a vital tool in equipping the younger generation to tackle the multifaceted challenges confronting society. Thus, combining ESD concepts into STEM education becomes an effective way to foster sustainable future. In this study, we explain in detail how to integrate ESD into STEM education. To achieve the goals of education for sustainability, it is obligatory to implement an appropriate pedagogy in the teaching–learning process. According to our findings, the strategies to integrate ESD into STEM education are: 1) Incorporating concepts of SDGs into STEM lessons, 2) Promoting hands-on activities and projects, 3) Designing real-world problems to apply STEM in addressing sustainability challenges, 4) Fostering partnerships with local communities, organizations, and industry stakeholders, and 5) Providing training and resources for educators to enhance their understanding of STEM-ESD teaching. In essence, fostering a more sustainable world through STEM-ESD education necessitates students' acquisition of the necessary knowledge, skills, values, and attitudes. These elements empower them to actively participate in promoting sustainable development, and that can be achieved only through the collaborative effort of all participants, especially the teachers so that they have to strive to enhance the implementation of STEM-ESD teaching to its fullest potential.

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